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Site Management Plan
Fiscal Years 2009 through 2013

St. Juliens Creek Annex
Chesapeake, Virginia

NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Prepared for

Department of the Navy
Naval Facilities Engineering Command
Mid-Atlantic Division

Contract No. N62470-02-D-3052
CTO-0213

July 2008

Prepared by

CH2MHILL

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Acronyms and Abbreviations

ABM	abrasive blast media
AOC	Area of Concern
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
CVOC	chlorinated volatile organic compound
DNAPL	dense non-aqueous phase liquid
DoD	Department of Defense
DPT	direct-push technology
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
ERA	Ecological Risk Assessment
ERS	ecological risk screening
ESS	Explosives Safety Submission
FFA	Federal Facilities Agreement
FS	Feasibility Study
ft	feet, foot
ft^3	cubic feet
FY	fiscal year
GIS	Geographical Information System
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
IAS	Initial Assessment Study
IR	Installation Restoration
IRP	Installation Restoration Program
IRACR	Interim Remedial Action Completion Report
LUC	land use control
MARMC	Mid-Atlantic Regional Maintenance Center
MC	munitions constituents
MCL	maximum contaminant level
MD	munitions debris
MEC	munitions and explosives of concern
MIP	membrane interface probe

MRP	Munitions Response Program
MPPEH	material potentially presenting an explosive hazard
msl	mean sea level
NACIP	Navy Assessment and Control of Installation Pollutants
NAPEC	Naval Ammunition Production Engineering Center
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substance Pollution Control Contingency Plan
NFA	no further action
NPL	National Priorities List
NTCRA	non-time-critical removal action
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POL	petroleum, oil, and lubricant
PP	Proposed Plan
RA	Remedial Action
RAB	Restoration Advisory Board
RAO	remedial action objective
RACR	Remedial Action Completion Report
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	cyclotrimethylenetrinitramine
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RRR	Relative Risk Ranking
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SJCA	St. Juliens Creek Annex
SMP	Site Management Plan
SPAWAR	Space and Naval Warfare Systems Command
SSA	Site Screening Assessment
SVOC	semivolatile organic compounds
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TCRA	time-critical removal action
TNT	trinitrotoluene
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UU/UE	unrestricted use and unlimited exposure
UXO	unexploded ordnance

VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
VSI	visual site inspection
yd^3	cubic yards

SECTION 1

Introduction

This document presents the fiscal years (FYs) 2009 through 2013 Site Management Plan (SMP) for St. Juliens Creek Annex (SJCA), Chesapeake, Virginia. The SMP meets the requirements of the Federal Facilities Agreement (FFA) between the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, Region III of the United States Environmental Protection Agency (USEPA), and Virginia Department of Environmental Quality (VDEQ) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to address environmental contamination at applicable SJCA sites.

The SMP is intended to be used in the planning, scheduling, and environmental remedial response activities to be conducted at SJCA. The SMP provides brief site descriptions, summaries of previous investigations, conceptual schedules, and CERCLA activities for SJCA Installation Restoration Program (IRP) and Munitions Response Program (MRP) sites. The prioritization of activities and the conceptual schedules were developed by the SJCA Installation Restoration (IR) Partnering Team, which includes representatives from NAVFAC, USEPA, and VDEQ, and are based on several factors:

- The SJCA IR Partnering Team's relative ranking of the sites with regard to the potential risks that they may pose to human health and the environment
- NAVFAC's internal funding goal of having remedies in place at all "high–priority" sites by FY 2010
- Goals set by the SJCA IR Partnering Team to meet requirements of USEPA, VDEQ, NAVFAC, and the public

The drafting of this SMP was completed in July 2008 with concurrence from the USEPA and VDEQ; however, in accordance with the FFA, this SMP will not be considered as a Final document until funds authorized and appropriated by Congress are received by the Environmental Restoration, Navy (ER,N) Account, so that the planned work for this fiscal year, as defined in this SMP, can be accomplished. The SMP is a working document that is updated yearly to maintain current documentation and summaries of environmental actions at SJCA. This SMP updates and supersedes the FYs 2008 through 2012 SMP (CH2M HILL, 2007c).

SECTION 2

St. Juliens Creek Annex Description and Environmental History

2.1 St. Juliens Creek Annex Description

The SJCA facility is approximately 490 acres and is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, in southeastern Virginia (Figure 2-1). Most surrounding areas are developed and include residences, schools, recreational areas, and shipping facilities for several large industries.

SJCA began operations as a naval facility in 1849. The annex was one of the largest ammunition depots in the United States involving wartime transfer of ammunitions to various other naval facilities. Specific ordnance operations and processes conducted at SJCA included stockpiling Explosive D (ammonium picrate or picrate acid) for use in projectiles, manufacturing MARK VI mines, assembling small caliber guns and ammunition, storing torpedoes, filling shells, and testing ordnance. In 1975, all ordnance operations were transferred to the Yorktown Naval Weapons Station. As a result, decontamination was performed in, around, and under ordnance-handling facilities at SJCA in 1977.

SJCA has also provided non-ordnance services, including degreasing; operation of paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plants, wash racks, and potable water and salt water fire-protection systems; fire-fighter training; and storage of oil and chemicals.

Activity at SJCA has decreased in recent years and many of the aging structures are being demolished. The current primary mission of SJCA is to provide a radar-testing range and administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local naval activities. SJCA also provides light industrial shops and storage facilities for several tenant commands; including Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Mid-Atlantic Regional Maintenance Center (MARMC); and a cryogenics school.

2.2 Environmental History

2.2.1 Installation Restoration Program History

In 1975, the Department of Defense (DoD) began the Navy Assessment and Control of Installation Pollutants (NACIP) Program to assess past hazardous and toxic materials storage and disposal activities at military installations. The goals of this program were to identify environmental contamination resulting from past hazardous materials management practices, to assess the impacts of the contamination on public health and the environment, and to provide corrective measures as required to mitigate adverse impacts.

To meet the objectives of the NACIP Program, an Initial Assessment Study (IAS) was conducted at SJCA in 1981. Results of this study revealed that low-level concentrations of ordnance materials still existed at SJCA. Residues were also suspected from waste burning at the Burning Grounds (Site 5) and near the swamp between Buildings 257 and 130 (Site 2), pesticide and herbicide rinsate disposal at Cross Street and Mine Road (Site 8), and ordnance waste and rinse waters to the sediments of Blows Creek. However, the IAS concluded that the sites identified were determined not to pose a threat to human health and the environment, and no confirmation study was recommended.

In 1976, the Resource Conservation and Recovery Act (RCRA) was passed by Congress to address potentially adverse human health and environmental impacts of hazardous waste management and disposal practices. RCRA was legislated to manage the present and future disposal of hazardous wastes.

The first step under the RCRA corrective action process, a RCRA Facility Assessment (RFA), was conducted at SJCA in 1989. The RFA included a preliminary review of all available relevant documents and a visual site inspection (VSI) that identified 34 Solid Waste Management Units (SWMUs) and 12 Areas of Concern (AOCs). Twenty-three SWMUs (1, 2, 3, 4, 5, 6, 8, 9, 13, 14, 15, 16, 17, 19, 20, 23, 24, 25, 27, 30, 32, 33, and 41) and nine AOCs (B, C, D, E, G, H, I, J, and L) were recommended for further action. Detailed subsurface investigations, such as RCRA Facility Investigations (RFIs), were recommended at 10 SWMUs (1, 2, 3, 4, 5, 6, 8, 24, 30, and 32) and AOC L that represented the greatest concern based on waste management activities associated with these units.

In 1980, CERCLA, or "Superfund," was passed to investigate and remediate areas resulting from past hazardous waste management practices. This program is administered by USEPA or state agencies.

In 1983, a Preliminary Assessment (PA), the first step in the CERCLA process (the CERCLA process is further discussed in Section 2.3 of this SMP) was conducted at SJCA. Ambient air at Sites 1, 2, 3, 4, 8, and 13 was monitored for volatile organic compounds (VOCs) and radiation with an organic vapor meter and radiation meter, respectively. No readings above background were encountered, and no significant signs of contamination were observed at the sites. However, the PA report mentioned that various locations on the facility were contaminated with low-level residues of pesticide and herbicide materials. A confirmation study was not proposed.

The NACIP Program was revised in 1986 to reflect the requirements of CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA). This revised program is referred to as the IRP. The current IRP is consistent with CERCLA and applicable state environmental laws.

To assess whether SJCA should be proposed for the National Priorities List (NPL), the USEPA completed a Hazard Ranking System (HRS) evaluation in January 2000. SJCA was assigned a score of 50 based on the potential for surface water migration. Those facilities with HRS scores exceeding 28.5 are proposed for the NPL. Therefore, on February 3, 2000, USEPA proposed that SJCA be added to the NPL. The proposed listing was followed by a minimum 60-day review and comment period prior to the inclusion of SJCA on the NPL on July 27, 2000.

Following the inclusion of SJCA on the NPL, the SJCA IR Partnering Team was chartered to streamline the clean up of former disposal sites by using consensus-based site management strategies during the CERCLA process (described in Section 2.3). The Team consists of representatives from NAVFAC, USEPA, and VDEQ and meetings are held quarterly, or more frequently as necessary.

The FFA, negotiated between the Navy, USEPA, and VDEQ was signed in July 2004. In accordance with the FFA, all past and future work at IRP sites, SWMUs, and AOCs will be reviewed, and a course of action for future work requirements at each site will be developed. The FFA also includes specific requirements for the preparation and contents of the SMP.

2.2.2 Munitions Response Program History

The DoD has established the MRP under the Defense Environmental Restoration Program to address munitions and explosives of concern (MEC) and munitions constituents (MC) at sites other than operational ranges. The DoD and the Navy are establishing policy and guidance for munitions and response actions under the MRP; however, the key program drivers developed to date conclude that munitions response actions will be conducted under the process outlined in the National Oil and Hazardous Substance Pollution Control Contingency Plan (NCP), as authorized by CERCLA. Therefore, the Navy will work with the SJCA IR Partnering Team to follow the CERCLA process to address MRP sites identified at SJCA. To-date, only one MRP site, UXO-01, has been identified at SJCA.

2.3 Comprehensive Environmental Response, Compensation, and Liability Act Process

The objectives of the CERCLA process are to evaluate the nature and extent of contamination at a site and to identify, develop, and implement appropriate remedial actions (RAs) in order to protect human health and the environment. The major elements of the CERCLA process are:

- PA/Site Investigation (SI)
- Remedial Investigation (RI)/Feasibility Study (FS)
- Engineering Evaluation/Cost Analysis (EE/CA) and Removal Action (may be implemented at any time in the CERCLA process)
- Proposed Plan (PP)/Record of Decision (ROD)
- Remedial Design (RD)/RA
- Post-RA Monitoring and Reporting
- Response Complete (RC)/Remedy-in-Place (RIP)
- Community Involvement (implemented throughout the CERCLA process)

A brief description of each element is provided in the following subsections.

2.3.1 Preliminary Assessment/Site Investigation

The IRP begins with the initiation of concerns about a site, area, or potential contaminant source. The PA is a limited-scope assessment designed to distinguish between sites that clearly pose little or no threat to human health or the environment and those that may pose a threat and require further investigation. This stage typically involves a review of historical documents and a VSI. Based on the results, the PA may result in a determination of no further action (NFA); completion of an SI if there is insufficient information to reach a NFA decision; a removal action if significant threat to human health or the environment exists; or an RI/FS if remediation is deemed necessary.

The SI is conducted to make a general determination if activities at the site have impacted environmental media and determine whether a site should be included in the CERCLA RI/FS process. A SI typically includes the collection of environmental samples to determine what hazardous substances are present at a site and a screening risk assessment to determine if they have been released at levels posing an unacceptable risk to human health and the environment. The sites that do not require further investigation or response are designated as NFA. If there is insufficient information to reach a NFA decision a removal action or an RI/FS may be recommended.

2.3.2 Remedial Investigation/Feasibility Study

Based on the results of the PA/SI, a RI may be conducted. The RI is designed to characterize site conditions, determine the nature and extent of contamination assess the risk to human health and the environment posed by site contamination, and provide a basis for decisions on further response actions or NFA. During the RI, environmental samples are usually collected from all the media present at the site. The RI should provide information to refine the conceptual site model (CSM) and form the basis for the development of remedial action objectives (RAOs) and remedial strategies that will comprise the FS.

The FS is the mechanism for the development, screening, and detailed evaluation of alternative RAs to meet environmental standards and protect human health and the environment. The overall objectives of an FS are to develop and evaluate potential remedies that permanently and significantly reduce the threat to public health, welfare, and the environment; select a cost-effective RA alternative that mitigates the threat(s); and achieve consensus regarding the selected response action. The RI and FS can be conducted concurrently; data collected in the RI influences the development of remedial alternatives in the FS, which in turn affect the data needs and scope of potential treatability studies and additional field investigations. This phased approach encourages the continual scoping of the site characterization effort, which minimizes the collection of unnecessary data and maximizes data quality.

The need for a treatability study generally is identified during the FS. Treatability studies are performed to assist in the evaluation of a potentially promising remedial technology. The primary objectives of treatability studies are to provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the FS and to support the RD of a selected alternative. Treatability studies may be conducted at any time during the process.

Treatability studies may be classified as either bench-scale (laboratory study) or pilot-scale (field studies). For technologies that are well-developed and tested, bench-scale studies are often sufficient to evaluate performance. For innovative technologies, pilot-scale tests may be required to obtain the desired information. Pilot-scale tests simulate the physical and chemical parameters of the full-scale process, and are designed to bridge the gap between bench-scale and full-scale operations. Treatability studies may also be needed during the RD/RA phase to obtain more detailed information about the unit operations, performance, and cost for designing a full-scale treatment system. Generally, a pilot-scale system is deployed onsite to collect the required information.

2.3.3 Engineering Evaluation/Cost Analysis and Removal Action

A removal action is a response implemented in an expedited manner to address releases or threatened releases in order to mitigate the spread of contamination. Removal actions may be implemented at any time during the CERCLA process. Removal actions are classified as either time-critical removal actions (TCRAs) and non-time-critical removal actions (NTCRAs). Actions taken immediately to mitigate an imminent threat to human health or the environment, such as the removal of corroded or leaking drums, are classified as TCRAs. Removal actions that may be delayed for six months or more without significant additional harm to human health or the environment are classified as NTCRAs.

For a NTCRA, an EE/CA is prepared rather than the more extensive FS. An EE/CA focuses only on the substances to be removed rather than on all contaminated substances at the site. For EE/CAs, the public is provided an opportunity to comment during an announced formal public comment period. A removal action can be either the final remedy or an interim action followed by a RA as the final remedy, based on the extent to which the threats are mitigated by the action. A removal action, when implemented as the final remedy, can be used for fast and significant reductions in risk and to mitigate long-term threats. In cases where the removal action is the final remedy, the removal action may lead to NFA for the site. If the removal action was accomplished during the RI/FS phase, any final determination of NFA must be documented in the ROD. If the NCP nine criteria were not addressed as part of the EE/CA or Action Memorandum, a focused FS would be needed, followed by a ROD.

2.3.4 Proposed Plan/Record of Decision

The remedy selection process involves identifying a preferred response action strategy from those alternatives evaluated in the FS. The preferred alternative is based first on each alternative's ability to satisfy the threshold criteria, and then on trade-offs among alternatives considering the primary balancing criteria. Further, results of the risk assessment need to be factored into the selection of the remedy. The remedy selection process includes a PP and ROD.

A PP presents the remedial alternatives developed in the FS and recommends a preferred remedial method. The public has an opportunity to comment on the PP during an announced formal public comment period. Site information is compiled in an Administrative Record and placed in the Information Repository established at a local library for public review. During the public comment period for a PP, a public meeting is also held to provide supporting information. At the end of the public comment period, an

appropriate remedial alternative is chosen to protect human health and the environment. The ROD document is then issued, which describes the remedy selection process and the remedy selected. All parties directly involved in the IRP (Navy, USEPA, VDEQ, and public) must agree on the selected alternative. Any public comments received are addressed as part of the responsiveness summary in the ROD. A public notice is issued after the ROD is signed and available for public inspection. A public notice is also published for any significant post-ROD changes. Once the ROD has been signed, the RD/RA process is initiated.

2.3.5 Remedial Design/Remedial Action

Subsequent to the ROD, RD/RA activities are implemented. The technical specifications for cleanup remedies and technologies are designed in the RD phase. The purpose of the RD phase is to convert the conceptual design for the selected remedy from the FS into a full-scale detailed design for implementation. RD includes preparation of technical RD work plans, drawings, specifications, and RA work plans.

The RA phase is the actual construction or implementation of the cleanup process. The RA start date is defined as the date the contractor has mobilized and begun substantial and continuous physical onsite RA. The start date is important because it triggers the beginning of the Five-Year Review cycle if one is required. The RA phase involves two main components—RA construction and RA operation.

Interim RAs are implemented to provide temporary mitigation of human health risks or to mitigate the spread of contamination in the environment. Similar to removal actions, they may be implemented at any time during the process. Examples of interim RAs include installing a pump-and-treat system for product recovery from the groundwater or installing a fence to prevent direct contact with hazardous materials. For interim RAs, a focused FS is prepared rather than the more extensive FS. As with the removal action, an interim RA may become the final RA if the results of the risk assessment indicate that no further RA is required to protect human health and the environment.

2.3.6 Response Complete and Remedy-in-Place

At any point during the CERCLA process, a decision can be made that no further response action is required; properly documented (necessary regulatory notification or application for concurrence has occurred), these decisions constitute RC and/or site closeout. RC is the point at which the remedy has achieved the required reduction in risk to human health and the environment (cleanup goals/RAOs have been met). Once RC is completed for a site, a RA Completion Report (RACR) is prepared to demonstrate that the remedy is complete and the RAOs are met. RC is followed by individual site closeout.

For long-term remedies where it is anticipated that RAOs will be achieved over a long period, the RIP milestone signifies the completion of the RA construction phase, and that the remedy has been implemented and has been demonstrated to be functioning as designed (i.e., all testing has been accomplished and the remedy will function properly). Once RIP is completed for a site, an Interim RACR (IRACR) is prepared to document that the remedy is constructed and operating successfully. Once all RCs and RIPs have been documented for every site at the facility and the terms of the FFA have been met, site closeout and NPL deletion is requested.

2.3.7 Post-Remedial Action Monitoring and Reporting

Five-year reviews are required by CERCLA when hazardous substances remain onsite above levels permitting unrestricted use and unlimited exposure (UU/UE). Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Generally, reviews are performed 5 years after the initiation of a CERCLA response action, and are conducted every 5 years as long as future uses remain restricted. Five-year reviews for SJCA are performed by the Navy, the lead agency for the site, but USEPA retains responsibility for determining the protectiveness of the remedy.

2.3.8 Community Involvement

To learn how the public would like to be involved in the CERCLA process, community interviews are conducted and a Community Involvement Plan is developed based on the responses to outline community participation. Community participation at SJCA includes a Restoration Advisory Board (RAB), public meetings, information repository, fact sheets, public notices, and a web site (http://public.lantops-ir.org/sites/public/sjca/). The RAB was formed in 1999 and consists of community members and representatives of the Navy, VDEQ, and USEPA. RAB meetings are held semiannually (normally every May and October) and are open to the public to provide opportunity for comment and input on the IRP. The documents prepared as part of the IRP are maintained in the Administrative Record and listed at an information repository (Major Hillard Library, Chesapeake, Virginia) for review by the public. The Administrative Record and IR web sites are updated on a regular basis.

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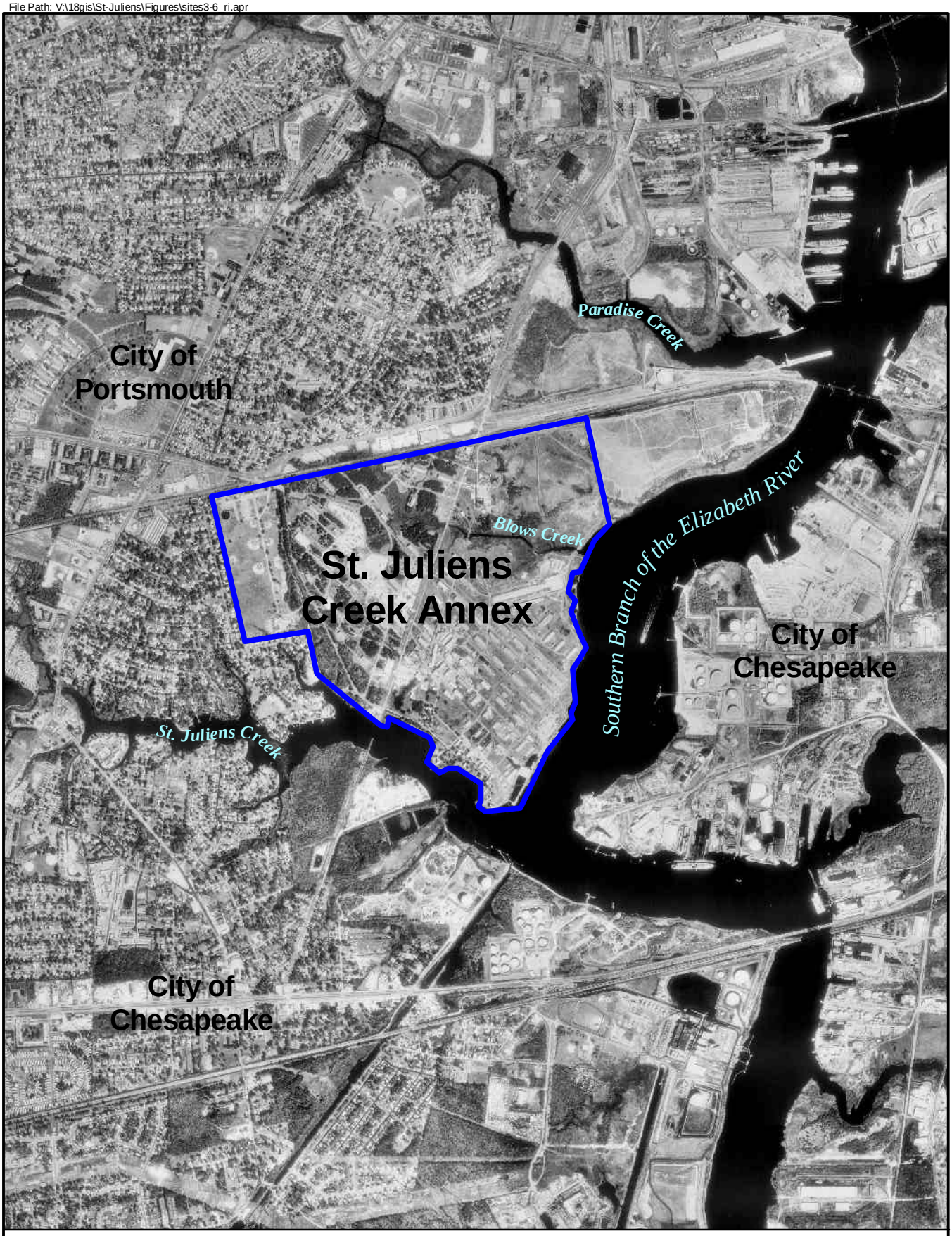


LEGEND

St. Juliens Creek Annex

N

0 1000 2000 3000 Feet

Figure 2-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

SECTION 3

Site Descriptions

Fifty-nine potentially contaminated IRP sites, MRP sites, SWMUs, and AOCs have been identified for evaluation at SJCA based on the previous assessments and investigations. Table 3-1 lists the status of each site. Four sites are currently active in the IRP at SJCA including Site 2, Site 4, Site 5, and Site 21 (Figure 3-1). One site, Site UXO-01, is currently active in the MRP at SJCA (Figure 3-2). Fifty-four sites at SJCA have been considered NFA under the IRP by the SJCA IR Partnering Team following desktop audits, site investigations, and/or removal actions (Figure 3-3). The following subsections present a brief site history, site description, summary of the site-specific investigations conducted, and planned future CERCLA activities at each active IRP and MRP site. Several facility-wide investigations have previously been completed through the IRP to-date, including:

- IAS: Navy Engineering and Environmental Support Activity, August 1981
- PA: NUS Corporation, 1983
- Phase II RFA: A. T. Kearney, March 1989
- Aerial Photographic Site Analysis: USEPA Region III, February 1995
- Relative Risk Ranking (RRR) System Data Collection Report: CH2M HILL, April 1996
- HRS Documentation Record: Tetra Tech, January 2000
- Basewide Background Investigation: CH2M HILL, October 2001 and August 2004
- Site Screening Assessment (SSA): CH2M HILL, April 2002

Table 3-2 provides a summary of the site-specific investigations conducted at each active site. The conceptual project schedule for IRP and MRP activities at SJCA is presented in Figure 3-4. The review and comment periods for deliverables shown in the schedule were based on FFA guidelines; flow charts depicting the process are included as Figures 3-5 through 3-7.

3.1 Preliminary Assessment/Site Investigation Sites

3.1.1 MRP Site UXO-01—Wharf Area Sediments

UXO-01 is the current and former wharf areas and piers along the shoreline of the Southern Branch of the Elizabeth River, comprising approximately 1,520 linear feet (ft). One wharf area, constructed in 1917 for loading Mark VI mines, was located in the northeast portion of SJCA adjacent to Buildings M-5 and 190. This wharf area is no longer present, with the exception of remaining pilings. During World War II, a second wharf area was constructed in the southeast portion of the SJCA to support the increased production for the war. Ordnance loading activities continued until the early 1970s, when production declined commensurate with the disengagement policy and the reduced operations in southeast Asia. The wharf was damaged when two ships struck the wharf in 1975; however, it is still functional. The northern wharf area was previously identified as Site 20 in the IRP.

The IAS indicated that Explosive Ordnance Disposal (EOD) team divers searched the Site 20 (northern wharf) area and identified metal and thick silt deposits near the former pier. It was concluded that ordnance had been dropped into the sediment adjacent to the former wharf area during loading and unloading operations. The ordnance were not considered a hazard as long as the sediment was not disturbed. The IAS recommended that real estate records be annotated to indicate that unexploded ordnance (UXO) may be present.

During the RRR, a site reconnaissance, magnetometer survey, and sediment sampling were conducted in the Site 20 (northern wharf) area. Approximately 68 contacts were identified in the area surrounding the former wharf pilings; however, contacts indicate all types of buried metallic objects and do not necessarily indicate the presence of buried ordnance and no visual confirmation of the contacts was made. One VOC, multiple semivolatile organic compounds (SVOCs), one pesticide, one explosive, and multiple inorganics were detected in the sediment.

As part of the SSA, the unvalidated analytical results from the sediment samples collected during the RRR were used to conduct human health and ecological risk screenings. No risk was identified to human receptors. Potential ecological risk was identified for benthic organisms in the sediment. Mercury and several polycyclic aromatic hydrocarbons (PAHs) were detected at similar concentrations as those detected in urban water bodies and 1,3-dinitrobenzene was only detected in one of four samples and no toxicity screening value exists. Therefore, the risk was considered minimal and no further evaluation of ecological risk was recommended.

During the July 2001 partnering team site visit, consensus was reached for NFA for Site 20 under CERCLA based on the findings of the human health and ecological risk screenings and the fact that potential risk from buried ordnance would be addressed under the Navy's Range Program. The NFA decision was documented in the SSA. Based on recommendations made in the SSA, signs were posted in the area to prohibit intrusive activities and the United States Army Corps of Engineers (USACE) was notified of the potential presence of buried ordnance. No Navy or USACE restrictions were implemented on the water body. The Navy's Range Program was never fully implemented, and ordnance sites are now addressed under the MRP. Because site history indicates a potential presence of buried ordnance, in 2008 the wharf areas (northern and southern) were identified as UXO-01 and included under the MRP.

Future activities at Site UXO-01 consist of:

- PA/SI

3.2 Remedial Investigation/Feasibility Study Sites

3.2.1 IRP Site 2—Waste Disposal Area B

Site 2 is a former waste disposal area covering approximately 5.7 acres at the intersection of St. Juliens Road and Cradock Street, in the southern portion of SJCA. In earlier documents, Site 2 was referred to as Dump B, Landfill B, and/or SWMUs 2, 3, and 4. Operations at the site began in 1921. Initially, refuse was burned openly onsite and used to fill an adjacent swampy area (Site 2 inlet). Mixed municipal wastes, organics, inorganics, solvents, waste ordnance, and abrasive blast media (ABM) were reportedly disposed of at Site 2. In 1942, an

incinerator was installed to replace the open burning practices, and was operated until sometime after 1947. The total volume of waste prior to burning is reported to have been approximately 35,000 cubic yards (yd^3).

Former Buildings 278/279, located just north of and adjacent to the Site 2 inlet, were designated as former IRP Site 17. Lead-acid battery maintenance reportedly began at Building 279 in 1954 and the waste acid electrolyte was collected and hauled offsite for disposal. Two 55-gallon drums of PD-680, a commercial degreaser, were observed stored on the concrete storage pad located just outside of Building 279, which had a release onto nearby soil. Ordnance wastewaters and rinse waters were reportedly discharged into the inlet in the vicinity of former Buildings 130 and 257. In 1989, the site was used to store heavy equipment and machinery.

Currently, Site 2 is bounded on the north by a parking lot; on the east by a grass-covered field; on the west by a storm water drainage ditch and Cradock Street; and on the south by St. Juliens Road and St. Juliens Creek. In the center of Site 2 is a water body surrounded by brush, trees, and grass directly connected to St. Juliens Creek. This inlet is tidally influenced and drains surface water from adjoining land into the creek. Grassed drainage ditches (approximately 2 to 3 ft deep) originate north of Site 2 along Cradock Street and discharge storm water runoff to the inlet. Surface runoff from an adjacent parking lot to the northwest of the inlet also drains directly into the inlet. An underground storm drainage system originates approximately 1,000 ft northeast of the Site 2 area, within IRP Site 21, and also outlets to the northernmost culvert to the inlet. The Site 2 topography ranges from 0 to 8 ft above mean sea level (msl), sloping towards the tidal inlet and St. Juliens Creek. Groundwater flow follows the topography and flows towards the inlet and creek. Concrete, brick, asphalt, and ABM are visible on the ground surface.

Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment—1997 through 2004

The RI field activities at Site 2 began in June 1997 and continued through August 2001. Activities included a geophysical investigation; waste delineation trenching; monitoring well installation; water-level monitoring; and the collection and analysis of surface and subsurface soil, groundwater, sediment, and surface water samples. Based on the waste delineation trenching results and historical aerial photograph reviews, it was determined that Site 2 had not been operated as a cut-and-fill landfill. Therefore, Site 2 was reclassified as a waste disposal area and the site boundary was adjusted to reflect the extent of waste.

The Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) conducted as part of the RI concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil and sediment (primarily inorganics, pesticides, and PAHs). Elevated concentrations of VOCs were present in the surface water but because surface water is transient, there was no significant risk to human health or the environment identified. No human health risk drivers were identified in shallow or deep groundwater.

The RI recommended further evaluation of the potential for adverse effects to aquatic life in the inlet sediment, investigation of the potential source of VOCs to surface water, and additional investigation of shallow groundwater because the existing shallow monitoring wells were located outside of, or on the outer limits of, the waste disposal area and did not sufficiently characterize potential groundwater contamination within the waste area.

Site 17 Supplemental Investigation—2001

SI activities were conducted in February 2001 to determine if there was contamination at Site 17 that required further investigation. The field investigation activities consisted of surface soil sample collection.

The qualitative HHRA and ERA conducted as part of the SI concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil (PAHs, pesticides, polychlorinated biphenyls [PCBs], and inorganics). Due to the proximity of Site 17 to Site 2, the SJCA IR Partnering Team agreed during the November 2003 partnering meeting to address the potential risks to human health and the environment identified during previous investigations at Site 17 as part of Site 2, and classified Site 17 as closed with NFA necessary.

Expanded Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment—2004 to Present

Based on the results of the Site 2 RI and data gaps identified, an Expanded RI was conducted. The Expanded RI investigation activities were conducted in phases from December 2003 through July 2007. Field activities included membrane interface probe (MIP) investigation, monitoring well installation, and groundwater sampling to further define the nature and extent of the shallow groundwater VOC plume and source area; deep aquifer testing to determine if VOCs have impacted the deep groundwater; storm water and surface water sampling to assess the source of VOCs in inlet surface water; sediment and sediment pore water sampling to further characterize ecological risks and to evaluate potential impacts to St. Juliens Creek; soil sampling to determine the presence/absence of natural attenuation parameters; direct-push technology (DPT) waste delineation to further delineate the horizontal and vertical extent of waste under the parking lot area; and a surface debris delineation to determine the spatial extent and type of surface debris in the wetland area.

The HHRA and ERA conducted as part of the Expanded RI concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil (primarily PAHs and inorganics), shallow groundwater (chlorinated VOCs [CVOCs]), sediment (inorganics and PAHs), and surface water (VOCs and inorganics). In addition, based on the nature of waste materials, the waste has not been fully characterized and is assumed to pose a potential risk to human health and the environment. The Expanded RI did not identify any human health risk in deep groundwater.

The results of the investigation activities have been incorporated into a Draft Expanded RI Report and submitted for review. The Draft Expanded RI recommended a FS to evaluate potential remedial alternatives to mitigate unacceptable human health and/or ecological risks in soil and waste, shallow groundwater, sediment, and surface water at Site 2.

Future activities at Site 2 consist of:

- Final Expanded RI Report
- FS
- PP and ROD
- RD and RA
- RACR/IRACR

3.2.2 IRP Site 5—Burning Grounds

Site 5 is the former Burning Grounds consisting of approximately 23 acres located in the northeastern portion of SJCA. In earlier documents, Site 5 was also referred to as SWMU 8 and was reported to consist of approximately 3 acres. Review of historical aerial photographs indicate that prior to use as a disposal area, the site and much of the adjacent area had been used for placement of dredge spoil material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River.

Operations began at the Burning Grounds in the 1930s when waste ordnance materials, including black powder (mixture of charcoal, nitrate, and sulfur), smokeless powder (nitrocellulose), Explosive D (ammonium picrate), and Composition A-3 (contains cyclotrimethylenetrinitramine [RDX] and wax), were disposed of by open burning on three main pads. Tetryl, trinitrotoluene (TNT), fuzes, solvents, paint sludge, pesticides, and various types of refuse were also disposed of. Reports stated that the Burning Grounds spontaneously caught fire several times in the 1970s. The amount of ordnance disposed of varied from year to year and there is insufficient information to calculate the waste volume. Interviews conducted with former employees in December 2001 indicated that asbestos piping was buried 10 ft below ground surface (bgs) (although investigation activities have only identified shallow waste) and that other material disposed of included tables and metal from buildings. In 1974, 427 tons of ordnance items were reportedly disposed of.

In mid-1977, the Burning Grounds was used for facility-wide ordnance and equipment decontamination. The decontamination process included filling equipment from buildings with oil and straw and igniting them. Afterwards, the ground surface was reportedly covered with oil and straw and burned. The top 6 inches of soil was then diced, and the ground surface was covered with oil and straw and burned again. After the decontamination was completed, the Naval Ammunition Production Engineering Center (NAPEC) collected samples for chemical analyses and certified decontamination; however, the level of decontamination was not specified.

The site currently consists of an open field with a wetland in the central portion and a forested area in the southern portion. A significant portion of the site's southwestern area is covered with a layer of gravel. The Site 5 topography is generally level and slopes gently toward Blows Creek. Groundwater flow follows the topography and flows toward Blows Creek. Vegetated drainage ditches (1- to 3-ft deep) are reducing runoff to the site from adjacent areas. Site 6, located within the east-central portion of Site 5, is a former IR site that was closed under a no action ROD in September 2003 after a removal action.

Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment—1997 through 2003

The RI field investigation activities included geophysical investigations; monitoring well installation; water-level monitoring; waste delineation; and the collection and analysis of surface and subsurface soil samples, groundwater samples, drainage sediment samples, and drainage surface water samples. Based on the waste delineation investigation conducted, it was determined that the extent of waste was greater than previously identified and the Site 5 boundaries were adjusted to reflect the extent of waste encountered.

The HHRA and ERA conducted as part of the RI concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil and upland drainage ditch sediment (primarily inorganics and PAHs). Because surface water is transient at the site and the upland ditches provide minimal ecological habitat, there is no significant risk to human health and the environment identified from direct exposure to surface water. Groundwater samples collected from the shallow monitoring wells at Site 5 indicated isolated detections of inorganics at concentrations above maximum contaminant levels (MCLs). In addition, an isolated detection of RDX was found in a sample collected from a deep monitoring well. The RI did not identify any human health risk in shallow groundwater; however, only the construction worker scenario was evaluated.

The RI recommended additional soil and groundwater sampling to further define the nature and extent of contamination in support of evaluating remedial alternatives for Site 5. Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was also recommended based on chemical concentrations of inorganics and pesticides in upland drainage ditch sediment/soil.

Baseline Ecological Risk Assessment, Blows Creek Watershed—2003 to 2006

A separate Baseline Ecological Risk Assessment (BERA) for Blows Creek was conducted to identify potential risk associated with possible historical contributions to Blows Creek from upland Navy IRP sites, including Site 5. Investigation activities included the collection and analysis of sediment and fish tissue samples. Results indicated limited potential for adverse effects to benthic-dwelling organisms from exposure to Blows Creek sediment based on the low frequency and magnitude of chemical concentrations exceeding ecological screening values and limited effects based on bioassay organism response; and no potential for adverse effects to avian piscivores (belted kingfisher) from the presence of mercury in Blows Creek fish or sediment. The Final BERA report documented that Blows Creek requires NFA under CERCLA. This NFA decision will be incorporated into the ROD for Site 5.

Expanded Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment and Addendum—2003 through 2007

An Expanded RI was conducted in December 2003 and included the collection and analysis of surface soil samples to fill spatial data gaps, better evaluate areas posing potential ecological risk, and evaluate potential remedial alternatives. Additionally, groundwater samples were collected from the existing monitoring wells to confirm or deny MCL exceedances of inorganics in shallow groundwater and the presence/absence of RDX in deep groundwater identified during the RI. In addition, the HHRA from the RI was revised to evaluate residential scenarios. Based on the new and historical data, the revised HHRA indicated that shallow groundwater presented potential human health risk to future residents. Due to the variability in analytical results in shallow groundwater over time, additional groundwater samples were collected in 2006. After reviewing all of the shallow groundwater data, the SJCA IR Partnering Team agreed to risk manage shallow groundwater with NFA. The shallow groundwater HHRA was revised and the results and risk management rationale was documented in an addendum to the Expanded RI.

Based on the RI and Expanded RI results, the areas posing potential human health and/or ecological risks warranting additional investigation and/or RA to achieve the RAO of

UU/UE consist of the waste and burnt soil, and sporadic metals and pesticides in surface soil and drainage ditch sediment.

Engineering Evaluation/Cost Analysis and Action Memorandum—2006

Based on the findings of the RI and Expanded RI, an EE/CA was conducted to identify and analyze removal action alternatives to mitigate potential risk in the waste/burnt soil area and impacted surface soil and drainage sediment areas. Four alternatives were identified, evaluated, and ranked. Based on a comparative analysis of the alternatives, the recommended NTCRA involved excavation, disposal characterization, disposal of waste/ burnt soil and impacted surface soil and drainage sediment, and restoration of the site as a mixed wetland/upland habitat. The volume of the material that will be removed is estimated to be 24,930 yd^3.

The determination of the limits of the excavations varies based on the different areas, dependent on the media and whether or not they are driven by human health or ecological risk. The waste/burnt soil will be excavated to visible limits and confirmatory samples will be collected to verify that cleanup goals are met. The impacted surface soil and sediment will be excavated to a depth of 1 ft based on subsurface soil data from the RI. With the exception of three areas which will be delineated by pre-confirmation samples, the horizontal extent of the impacted surface soil and sediment areas has been defined by existing sample locations. Confirmation sampling will be conducted for the impacted surface soil and sediment areas that are being removed based on human health risk; those driven by ecological risk will not require confirmation sampling. Site restoration includes the placement of a minimum of 6 inches of topsoil to provide a suitable planting base; vegetative stabilization of the upland portion of the site with native grasses, shrubs, trees, and wildflowers; establishment of an emergent wetland in the eastern portion of the site by planting emergent wetland plants; and establishment of transitional wetland areas between the upland and emergent wetland by planting wetland shrubs and trees as well as seeding the area with emergent vegetation.

A public notice of availability of the draft EE/CA was issued on February 8, 2007 and the EE/CA was made available to the public for comment from January 19 to February 18, 2007. No comments were received. Therefore, the Navy signed an Action Memorandum on March 20, 2007 to implement the NTCRA as specified in the EE/CA.

Removal Action—2007 to Present

The NTCRA activities were initiated in December 2007; however, work was stopped based on MEC found during mobilization. Following resolution of an Explosives Safety Submission (ESS) in 2008, remobilization will occur.

Future activities at Site 5 consist of:

- NTCRA completion
- PP and ROD

3.2.3 IRP Site 21—Industrial Area

Site 21 is located in the central industrial portion of SJCA. The site was initially identified as Building 187, a locomotive shed used for maintenance. Based on investigations, the Site 21

area has been expanded to encompass the underlying VOC groundwater plume. Buildings at Site 21 were historically used for machine, vehicle, and locomotive maintenance, and electrical shops; and munitions loading facilities. Railroad tracks were present throughout the industrial area and a fuel service station was located in the vicinity. Several of the buildings and/or surrounding areas were former IRP sites (Sites 9, 10, 11, 12, 13, 14, 18, and AOC E). Many of the older buildings at the site have been demolished. The existing buildings and the Site 21 area are currently used for storage and maintenance activities. An active warehouse used by MARMC was constructed in 1992. A storm sewer system runs through the site and drains to a downstream inlet (Site 2) to St. Juliens Creek.

Site Screening Assessment—2002

As part of the SSA, the unvalidated analytical results from soil and groundwater samples collected during the RRR were used to conduct human health and ecological risk screenings. Based on the elevated VOC concentrations detected in groundwater and potential human health risks identified, the SSA recommended further evaluation of Site 21 groundwater. Additionally, low level VOCs were detected at nearby Site 11 (former Building 53), an electrical shop where solvents were reportedly disposed of on the railroad track bed. Therefore, the SSA recommended that future investigations of groundwater at Site 21 encompass former Site 11 due to the proximity of the two sites. NFA was recommended for surface soil or for evaluating potential ecological effects.

Supplemental Investigation—2003

Based on the results of the SSA, an SI was conducted at Site 21 in August 2003. The SI field activities included a MIP investigation to delineate the vicinity of elevated VOCs, monitoring well installation, and collection of groundwater samples. Potential human health risks were identified from VOCs and RDX in shallow groundwater, and chloroform, arsenic, and vanadium in deep groundwater. The SI recommended further evaluation of VOCs in shallow groundwater through the installation and sampling of additional monitoring wells and resampling of select existing monitoring wells to confirm or deny elevated concentrations of inorganics and RDX.

Remedial Investigation—2003 to 2008

The RI activities were conducted from December 2003 through February 2007. The investigation activities were initially identified as Supplemental SI activities; however, the SJCA IR Partnering Team concluded that the data collected was sufficient to satisfy the objectives of a RI. To expedite the site closeout approach, the Draft Supplemental SI Report submitted in 2005 was not finalized, and the site data was incorporated into a RI Report. The field activities consisted of storm water sampling and a storm sewer system video inspection to evaluate the potential for transport and release of CVOCs from shallow groundwater through the adjacent storm sewer system; depth-specific soil and groundwater sampling to confirm the presence or absence of dense non-aqueous phase liquid (DNAPL); and MIP investigation, groundwater sampling, and permanent monitoring well installation to further define the plume boundary and source areas and evaluate groundwater characteristics for remedial alternative evaluation.

The HHRA conducted as part of the RI concluded that there is potential risk to current and future human receptors from potable use and indoor air inhalation of CVOCs in shallow

groundwater. The HHRA also identified potential human health risks from exposure to arsenic and vanadium in deep groundwater; however, because arsenic and vanadium were not detected in the shallow aquifer in the area and the Yorktown confining unit appears to be competent in the area, it was concluded that the deep groundwater has not been impacted by Site 21 activities and requires NFA. An ERA was not conducted in the RI based on the recommendations of ecological risk screenings (ERSs) conducted during the SSA and SI. The ERSs concluded that Site 21 provides little terrestrial habitat; no aquatic habitat for potential ecological receptors; and based on the transport distance before discharging to surface water, and the potential for mixing and dilution, a minimal potential for adverse effects to aquatic life from the presence of trichloroethene (TCE) in groundwater. Therefore, no further ecological risk evaluation was required.

The RI recommended a FS to evaluate potential remedial alternatives to mitigate unacceptable human health risks from the site-related contaminants, CVOCs, in shallow groundwater. Because of the potential risk identified from vapor intrusion into Buildings 54 and 1556, and the uncertainties associated with the Johnson and Ettinger model, the RI also recommended further evaluation of the potential vapor intrusion pathway. Collection of data to further evaluate the vapor intrusion pathway is ongoing. Results of the investigation will be incorporated into an addendum to the RI. If risk is identified based on the vapor intrusion evaluation, it will be incorporated into the FS**.**

Future activities at Site 21 consist of:

- FS Report
- RI Report Addendum
- PP and ROD
- RD and RA
- RACR/IRACR

3.3 Response Complete Sites

Fifty-five sites at SJCA have been considered NFA under the IRP by the SJCA IR Partnering Team following desktop audits, site investigations, and/or removal actions (Table 3-1 and Figure 3-3). There is one site at SJCA (IRP Site 4) requiring post-ROD land use controls (LUCs) (Figure 3-1). The LUCs are detailed on Table 3-3.

3.3.1 IRP Site 4—Landfill D

Site 4 is an approximately 8.3–acre landfill in the northeastern portion of SJCA located at the confluence of Blows Creek and the Southern Branch of the Elizabeth River. The site is located on dredge fill material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. In earlier documents, Site 4 was referred to as Dump D or SWMU 6 and included SWMU 7 and AOC L and was reported to consist of only 5 acres.

The first indication of activity at Site 4 is trenching identified on a historical aerial photograph from 1961. The trenches were filled with trash, wet garbage, and soil from subsequent trenches. The IAS indicated that around 1970, sanitary landfill operations began at Site 4 in the marshes of Blows Creek. Disposal included primarily trash and wet garbage.

Sanitary landfill operations continued until 1976, at which time trash and garbage were hauled to an offsite facility and inert construction material was then disposed of at the landfill. The RFA indicates that refuse disposal continued until 1981. The wastes managed were primarily trash, wet garbage, construction material, and outdated civil defense stores. Although the RFA indicated that some solvents, acids, bases, and PCBs were disposed of at Site 4, it is assumed that these materials were disposed of prior to 1976 because the IAS states that only inert material was disposed of after that date. Wastes disposed of at Site 4 were estimated at 1.5 million cubic feet (ft^3). Sample results from the RI do not indicate the presence of chlorinated solvents or hazardous materials in soil or groundwater at Site 4. Based on the findings of the RI and historic disposal dates, Site 4 does not require closure as a hazardous waste landfill.

Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment—1997 through 2003

The RI field activities at Site 4 began in 1997 and continued through 2003. Activities included a geophysical investigation; monitoring well installation; water-level monitoring; and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples. Based on a review of historical aerial photographs and site reconnaissance, it was determined that the extent of waste was greater than previously reported, extending west from the original site boundary. Therefore, the Site 4 boundary was adjusted to reflect the extent of waste.

The HHRA and ERA conducted as part of the RI concluded that there was potential risk to human and ecological receptors from exposure to chemicals in soil (primarily inorganics and PAHs) and elevated mercury concentrations in the adjacent drainage ditch. Because surface water is transient and the upland ditches provide minimal ecological habitat, there was no significant risk to human health and the environment identified from direct exposure to surface water. No human health risk drivers were identified for the shallow Columbia aquifer groundwater. Although human health risk drivers (primarily inorganics) were identified for the deeper Yorktown aquifer, the SJCA IR Partnering Team determined the risks to be acceptable based on the concentrations of chemicals, the risks identified with these chemicals, and the nature of the groundwater flow conditions.

The RI recommended an FS be prepared to evaluate remedial alternatives to mitigate risks from soil, waste, and sediment at Site 4 and eliminate concern for continued transport of potential contaminants to Blows Creek via the site-related drainage ditches.

Feasibility Study—2004

As part of the FS for Site 4, remedial alternatives were evaluated to minimize contact of human and ecological receptors with landfill contents, reduce infiltration and leaching of contaminants from the landfill to the groundwater, and prevent surface water run-on and control surface water runoff and erosion. The remedial alternatives evaluated were no action, soil cover, RCRA Subtitle D Cap, and excavation and offsite disposal. Based on the comparative analysis; soil cover with removal of wetland debris, removal of the eastern drainage ditch, and LUCs was recommended as the preferred alternative for Site 4.

Proposed Plan and Record of Decision—2004

The PP for Site 4 identified the preferred alternative for addressing potential contamination at Site 4. A public notice of the meeting and availability of the PP was issued on April 29, 2004. The Navy provided a public comment period from May 12 through June 12, 2004. A public meeting to present the PP was held on May 17, 2004 at the Major Hillard Library. No significant changes were made to the preferred RA alternative identified in the PP as a result of the public meeting and comment period. The ROD documenting the Selected Remedy; soil cover with removal of wetland debris, removal of the eastern drainage ditch, and LUCs was signed in September 2004.

Remedial Design/Remedial Action—2004 through 2006

The RD for the soil cover and drainage ditch components of the Selected Remedy was completed in November 2004. The RA was conducted from March through October 2005 and is documented in the Final Construction Closeout Report (JV 1, 2005). The RD for LUCs was completed in June 2006.

Remedial Action Completion Report—2006

The RACR was prepared to document the completion of the RA and demonstrate that the RAOs identified in the ROD have been met to achieve RC in accordance with CERCLA.

Annual visual soil cover and LUC inspections will be conducted to ensure the effectiveness of the cover is maintained. Additionally, because waste will remain onsite above levels that allow for UU/UE, LUCs will be maintained at the site and CERCLA Five-Year Site Remedy Reviews will be conducted.

Voluntary Groundwater Performance Monitoring—2006 to present

The SJCA IR Partnering Team agreed to conduct voluntary post-ROD groundwater monitoring at Site 4 to evaluate the site's impact on groundwater quality to confirm no potential future releases will pose unacceptable risk. The groundwater monitoring will be completed in FY 2008 and the results documented in a report in FY 2009.

Future activities at Site 4 consist of:

- Voluntary Groundwater Performance Monitoring and Report
- Annual Visual Soil Cover and LUC Inspections
- CERCLA Five-Year Site Remedy Review

Table 3-1
Site Status Summary Table
Site Management Plan (FY 2009 - 2013)
St. Juliens Creek Annex
Chesapeake, Virginia

Site ID	Name/Description	Other ID	Status	Comments	Documentation of Closure
MRP Sites					
UXO 001	Wharf Area Sediments	Residual Ordnance at wharf area; RFA - AOC I; Site 20	PA/SI	PA/SI will be conducted in FY 2009.	
IRP Sites					
Site 2	Waste Disposal Area B	Dump B; Dump B Incinerator; Dump B Blast Grit; RFA - SWMU 2, SWMU 3, SWMU 4	RI/FS	Final Site 2 RI completed February 2004 recommending Expanded RI to further investigate groundwater, sediment, and surface water; Draft Expanded RI submitted in April 2008 and will be finalized in FY 2009. FS will be drafted in FY 2009.	
Site 5	Burning Grounds	RFA - SWMU 8	RI/FS	Final RI completed March 2003 recommending Expanded RI to further investigate surface soil and groundwater; Final Expanded RI Report submitted June 2006 recommending additional groundwater sampling; Final EE/CA for NTCRA of Waste/Burnt Soil Area submitted in February 2007. Final Expanded RI addendum recommending NFA for groundwater submitted in December 2007. NTCRA began in December 2007 and will be completed in FY 2009.	
Site 21	Industrial Area	None	RI/FS	Final SI submitted in June 2004 recommending Supplemental SI to further investigate groundwater; Draft Supplemental SI Report submitted April 2006 recommending additional delineation. Draft RI Report submitted in December 2007 recommending further investigation of potential indoor air vapor risk. RI will be finalized in FY 2008 and the FS submitted in FY 2009.	
Site 4	Landfill D	Dump D; Old Tanks at Dump D; RFA - SWMU 6, AOC L	Response Complete - LUCs	Final RI completed March 2003; Final FS completed March 2004; PRAP finalized June 2004; ROD signed September 2004, RD submitted November 2004; RA completed in October 2005; RACR signed October 2006. LUCs implemented, site inspections continuing annually.	Final ROD signed September 2004 .
Site 1	Waste Disposal Area A	Dump A; RFA - SWMU 1	Response Complete - NFA	Consensus for NFA by Navy, VDEQ, and EPA in November 2002 based on RRR data and September 2002 test pit information.	Consensus for NFA as documented in an Addendum to the SSA in January 2003.
Site 3	Waste Disposal Area C	Dump C; Dump C Waste Disposal Pits; RFA - SWMU 5, SWMU 30	Response Complete - NFA	Final RI completed March 2003; Final EECA/Action Memorandum completed August 2002; Phase I Removal conducted September 2002; Phase II Removal conducted 2004; Final Construction Closeout Report completed March 2003; PRAP finalized January 2005; NFA ROD signed February 2006.	Final NFA ROD signed February 2006.
Site 4	Dumpster Storage at Landfill D	Dumpster storage at Dump D; RFA - SWMU 7	Response Complete - NFA	RFA indicated that the dumpsters were no longer present.	Final ROD signed September 2004 .
Site 6	Small Items Pit	Caged Pit, RFA - SWMU 24	Response Complete - NFA	Final RI completed March 2003; Final EE/CA and Action Memorandum completed August 2002; Removal Action completed September 2002; Final Close-Out Report in March 2003; PRAP finalized July 2003; NFA ROD signed September 2003.	NFA Final ROD signed September 2003.
Site 7	Old Storage Yard	Old Storage Yard #1; RFA - SWMU 17	Response Complete - NFA	Consensus for NFA in July 2001 by Navy, VDEQ, and EPA pending debris removal. Debris removal was conducted FY 2002 and is documented in a construction removal document completed FY 2003.	July 2001 Tier I Partnering Meeting Minutes and documented in FFA.
Site 8	Cross and Mine	RFA - SWMU 9; FFA - PSA Site 8	Response Complete - NFA	Final SSA completed April 2002 recommending an SI to further investigate potential release to groundwater; Identified in the FFA as Preliminary Screening Area (FFA Appendix B) March 2004; Final SI completed June 2004 recommending NFA; Consensus for NFA by Navy, VDEQ, and EPA July 2004	Signature Page in Final SI (June 2004).
Site 9	Pest. Control Bldg. 249	PA - SWMU 13	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 9	Oil Water Separator at Bldg. 249	RFA - SWMU 23	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 9	Washrack Bldg. 249	RFA - SWMU 25	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 10	Waste Disposal at Railroad Tracks	Hazardous Waste Disposal Area at Bldg. 13 (Railroad Tracks); RFA - SWMU 14	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 10	Swale beneath Bldg. 13	RFA - SWMU 31	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 11	Waste Disposal at Building 53 (formerly referenced to Bldg. 266)	RFA - SWMU 15	Response Complete - NFA	Consensus by Navy, VDEQ, and EPA for NFA during a site visit in July 2001 for Site 11 and groundwater underlying site will be investigated as part of Site 21.	Consensus for NFA as documented in the November 2002 SSA.
Site 12	Sand Blast Area Bldg. 323	RFA - SWMU 16	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 13	Waste Generation Area	RFA - SWMU 20	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 14	Washrack Bldg. 266	None	Response Complete - NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building and documented in FFA.
Site 15	Fire Training Area	Fire Training Area at Bldg. 271; RFA - SWMU 27	Response Complete - NFA	Will be investigated under the Navy's Underground Storage Tank (UST) program and therefore, NFA under CERCLA consensus by Navy, VDEQ, and EPA in July 2002.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 16	DRMO Storage/Salvage Yard	RFA - SWMU 28	Response Complete - NFA	While active, the DRMO does not fall under CERCLA and therefore, NFA under CERCLA consensus by Navy, VDEQ, and EPA in July 2002. Regional inspections are conducted for storm water management.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 17	Storage Pad at Building 279	Satellite storage at Bldg. 279; RFA - AOC A	Response Complete - NFA	The roof and walls of Building 278/279 were demolished in early 2003, the flooring and concrete pilings are still in place awaiting final removal. Based upon the proximity to Site 2, consensus in February 2003 by Navy, VDEQ, and EPA that further action related to Site 17 will be addressed as part of Site 2.	February 2003 Tier I Partnering Meeting Minutes and documented in FFA.
Site 18	Blasting Grit at Building 47	RFA - AOC C	Response Complete - NFA	During the July 2001 SJCA Partnering Team site visit, no blast grit was observed in several hand auger borings therefore, consensus for NFA was reached by Navy, VDEQ, and EPA.	Consensus for NFA as documented in the November 2002 SSA.
Site 18	Air Compressor at Bldg. 47	RFA - AOC B	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA in July 2002. Regional inspections are conducted for storm water management.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
Site 19	Building 190	Residual Ordnance at Bldg. M-5 & 190 RFA - AOC H	Response Complete - NFA	Final SI submitted in June 2004 recommending Supplemental SI to further investigate soil and groundwater; Final Supplemental SI submitted in September 2005 recommending EE/CA for a soil hotspot NTCRA; Final EE/CA for NTCRA submitted in November 2005; Final Action Memorandum signed in January 2006; NTCRA conducted in May 2006; Final Site Closeout Report signed December 2006.	Final Site Closeout Report signed December 2006.
Site 20	Wharf Area Sediments	Residual Ordnance at wharf area; RFA - AOC I; Site 20	Response Complete - NFA	During the July 2001 site visit, the Navy, VDEQ and EPA reached consensus for NFA under CERCLA. Site will be managed under the MR Program.	Consensus for NFA as documented in the November 2002 SSA.
SWMU 10	Hazardous Waste Container Storage Bldg. 254Y	None	Response Complete - NFA	Recommended for NFA in the RFA as SWMU 10 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and EPA for NFA under CERCLA in July 2002, as SWMU 10 was managed under RCRA.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 11	Hazardous Waste Container Storage Bldg. 163Y	None	Response Complete - NFA	Recommended for NFA in the RFA as SWMU 11 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and EPA for NFA under CERCLA in July 2002, as SWMU 11 is managed under the Virginia Hazardous Waste Management Regulations (VHWMR).	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 12	PCB Storage Bldg. 198	None	Response Complete - NFA	Recommended for NFA in the RFA. SWMU 12 is a current storage facility managed under Toxic Substances Control Act (TSCA) therefore, consensus by Navy, VDEQ, and EPA for NFA under CERCLA in July 2002.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
SWMU 18	Old Storage Yard # 2	None	Response Complete - NFA	Recommended for NFA in the RFA. Currently in operation and Regional inspections are conducted for storm water management. Consensus by Navy, VDEQ, and EPA for NFA under CERCLA.	FFA

Table 3-1
Site Status Summary Table
Site Management Plan (FY 2009 - 2013)
St. Juliens Creek Annex
Chesapeake, Virginia

Site ID	Name/Description	Other ID	Status	Comments	Documentation of Closure
SWMU 19	Old Storage Yard # 3	None	Response Complete - NFA	RFA recommended action for better management practice. A site visit was performed in November 2002 by Navy, VDEQ, and EPA to confirm status and consensus for NFA under CERCLA was reached.	FFA
SWMU 21	Hazardous Waste Accumulation Area (SIMA # 2)	None	Response Complete - NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and EPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 21.	Closure letter submitted to VDEQ and documented in FFA.
SWMU 22	Repair Shop Satellite Storage Area NE of Bldg. 40	None	Response Complete - NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and EPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 22.	Closure letter submitted to VDEQ and documented in FFA.
SWMU 26	Scrap Metal Storage in Railroad Cars near Bldg. 176	None	Response Complete - NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and EPA, as the SWMU is managed under RCRA.	FFA
SWMU 29	Dumpsters (throughout the facility)	None	Response Complete - NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and EPA, as the SWMU is managed under RCRA.	FFA
SWMU 32	Overland Drainage Ditches	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA, as drainage ditches associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will identify the exact boundaries of the drainage ditch and samples will be collected at all locations where there is either visible evidence of release or suspicion that past releases may have occurred.	FFA
SWMU 33	Sewer Drainage System	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA, as the sewer drainage system associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will include evaluating the integrity of the subsurface system and may include soil sampling to determine if hazardous constituents have been released.	FFA
SWMU 34	Operational Waste Accumulation Areas	None	Response Complete - NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and EPA, as the SWMU is managed under RCRA.	FFA
AOC D	Storm Water Outfalls	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA, as the storm water outfalls will be investigated under CERCLA on a site-specific basis. Site-specific investigations may include sampling various outfalls to determine whether there has been a release of hazardous constituents.	FFA
AOC E	Temporary Pump Storage	None	Response Complete - NFA	AOC E was remediated during a removal action conducted as part of the SIMA facility construction. Therefore, the SJCA Partnering Team reached consensus for NFA for AOC E based on the removal action.	Closed out during the construction of the SIMA building and documented in FFA.
AOC F	Underground Storage Tanks	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA in July 2002, as AOC F is managed under the Navy's UST Program.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
AOC G	Former Process Buildings	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA in July 2002 however, as new information becomes available on the locations and processes conducted at former process buildings, the SJCA Partnering Team will determine if new AOCs should be added. Any former process buildings identified for further evaluation will be evaluated on a site-specific basis.	July 2002 Tier I Partnering Meeting Minutes and documented in FFA.
AOC J	Former Ammunition Manufacturing Areas	None	Response Complete - NFA	Navy, VDEQ, and EPA reached consensus for NFA under CERCLA, however, as new information becomes available on the manufacturing areas, the SJCA Partnering Team will determine if new AOCs should be added. Any former ammunition manufacturing areas identified for further evaluation will be evaluated on a site-specific basis.	FFA
AOC K	Former Sewage Treatment Plant	FFA - SSA AOC K	Response Complete - NFA	Identified in the FFA as Site Screening Area (FFA Appendix A) March 2004; Final SSA completed June 2004 recommending NFA; Consensus for NFA by Navy, VDEQ, and EPA July 2004.	Signature Page in Final SSA Addendum (June 2004).
EPIC AOC 1	E Street and Marsh Road Ground Scarring	AOC 1; FFA - PSA AOC 1	Response Complete - NFA	Final SSA completed April 2002 recommending an SI to further investigate soil; Identified in the FFA as Preliminary Screening Area (FFA Appendix B) March 2004; Final SI completed June 2004 recommending NFA; Consensus for NFA by Navy, VDEQ, and EPA July 2004.	Signature Page in Final SI (June 2004).
EPIC AOC 2	Piers in front of Building 83	AOC 2	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 3	Ground Scarring at Building M5	AOC 3	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 4	Parking Area South of Building M-1	AOC 4	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 5	Possible Soil Staining Between Buildings 87 and 88	AOC 5	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 6	Ground Scarring East of Site 2	AOC 6	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 7	City of Portsmouth Outgrant Area	AOC 7	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 8	Possible Waste Disposal/Bulk Storage Area	AOC 8	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 9	Ground Scarring Southwest of Building 74	AOC 9	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 10	Ground Scarring in Wharf Area	AOC 10	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 11	Open Storage Area Northeast of Building 55	AOC 11	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 12	Sandy Flat	AOC 12	Response Complete - NFA	NFA consensus by Navy, VDEQ, and EPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
AOC 13	PCP Dip Tank	AOC 13; FFA - SSA AOC 13	Response Complete - NFA	Identified in the FFA as Site Screening Area (FFA Appendix A) March 2004; Final SSA completed June 2004 recommending NFA; Consensus for NFA by Navy, VDEQ, and EPA July 2004.	Signature Page in Final SSA Addendum (June 2004).
AOC 14	Building 89	AOC 14; FFA - SSA AOC 14	Response Complete - NFA	Identified in the FFA as Site Screening Area (FFA Appendix A) March 2004; Final SSA completed June 2004 recommending NFA; Consensus for NFA by Navy, VDEQ, and EPA July 2004.	Signature Page in Final SSA Addendum (June 2004).

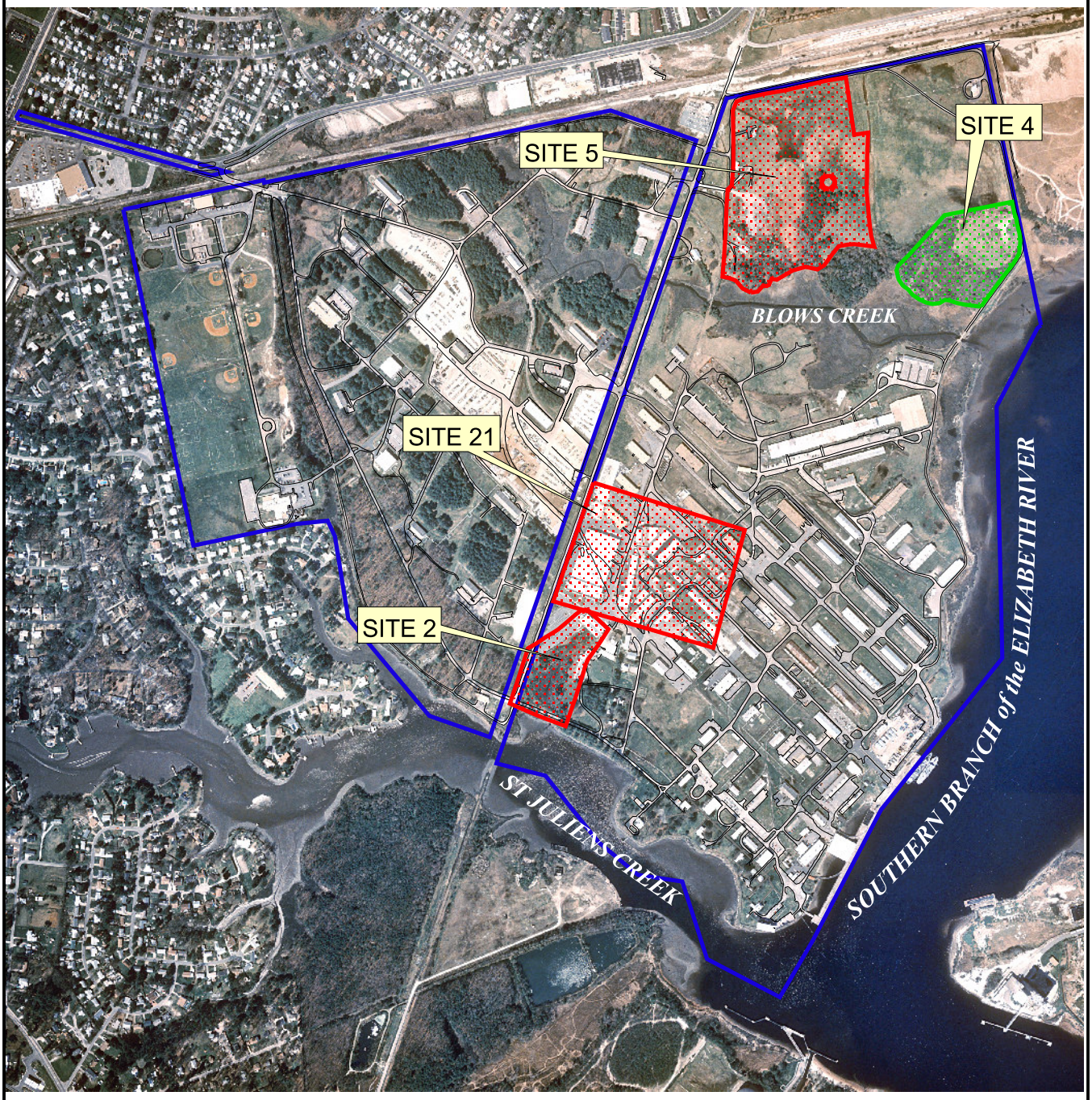
Table 3-2
Environmental Studies, Investigations, and
Actions Completed To-Date at Active IR and MR Sites
Site Management Plan (FY 2009 - 2013)
St. Juliens Creek Annex
Chesapeake, Virginia

IR Site	Preliminary Studies			Preliminary Investigations	RI	FS	EE/CA	Removal Actions	PP/ROD	RD/RA
	IAS (1981)	PA (1983)	RFA (1989)							
PA/SI Sites										
MR UXO-01[1]	X		X	RRR - 1996						
RI/FS Sites										
IR Site 2	X	X	X	RRR - 1996	2003 Expanded RI - 2007					
IR Site 5	X		X	RRR - 1996	2003 Expanded RI - 2007		2007			
IR Site 21	X		X	RRR - 1996 SSA - 2002 SI - 2004 Supplemental SI - 2006	2007					
Response Complete LUCs Sites										
IR Site 4	X	X	X	RRR - 1996	2003	2004			2005	2005

[1]Former IR Site 20

Table 3-3
Land Use Controls
Site Management Plan (FY 2009 - 2013)
St. Juliens Creek Annex
Chesapeake, Virginia

IR Site	Site Name	Date of Final ROD	Location on SJCA	Estimated Area	Land Use Control Objectives	Land Use Control Implementation and Maintenance Actions
Site 4	Landfill D	09/29/2004	Northeast portion of SJCA. North of Blows Creek at its confluence with the Southern Branch of the Elizabeth River.	8.32 acres	1) Prohibit digging into or disturbing the existing soil cover or contents of the landfill 2) Prohibit residential development on the site	•5-year site remedy reviews •Annual visual inspections of the soil cover •Survey plat registered in the Commonwealth of Virginia •Maintain posted signs •Maintain a Regional Shore Infrastructure Plan or similar document that incorporates LUC objectives •Notification to EPA and the Commonwealth of Virginia of any SJCA proposals for a major land use change at a site inconsistent with the use restrictions and exposure assumptions described in the ROD •Notification to EPA and the Commonwealth of Virginia prior to any changes in the risk, remedy, or land use; including any LUC failures with proposed corrective action •Obtain EPA and the Commonwealth of Virginia concurrence prior to modifying or terminating the LUC objectives or implementation actions •Maintain a comprehensive list of LUCs with associated boundaries and expected durations at IR office



LEGEND

- SJCA Boundary
- RI/FS Sites
- Response Complete - Sites with LUCs

N

0 500 1000 Feet

Figure 3-1
Location of Active IR Sites
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

LEGEND

- SJCA Boundary
- PA/SI Sites

N

0 500 1000 Feet

Figure 3-2
Location of Active MR Sites
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

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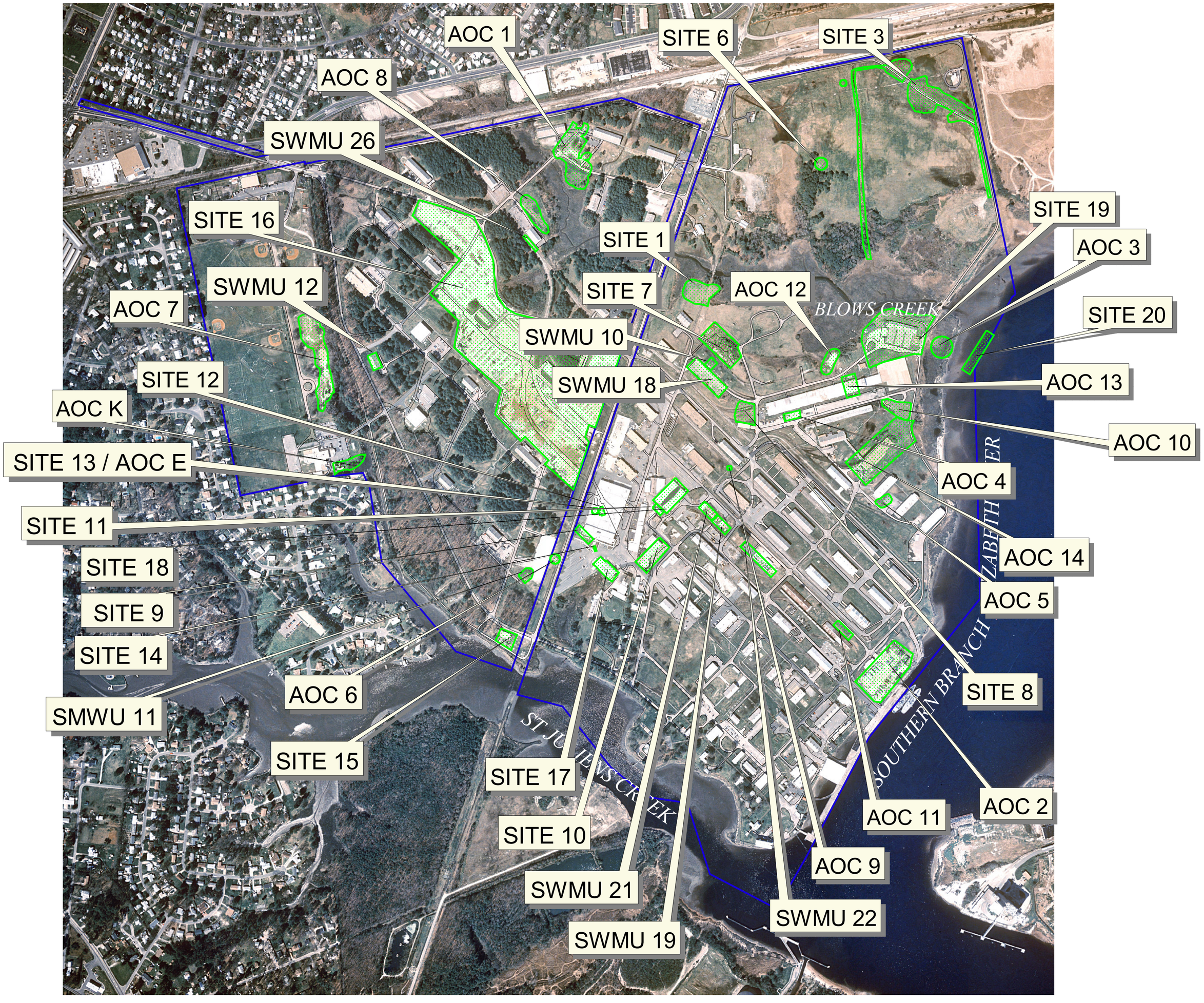


LEGEND

- SJCA Boundary
- Response Complete- No Further Action Sites

N

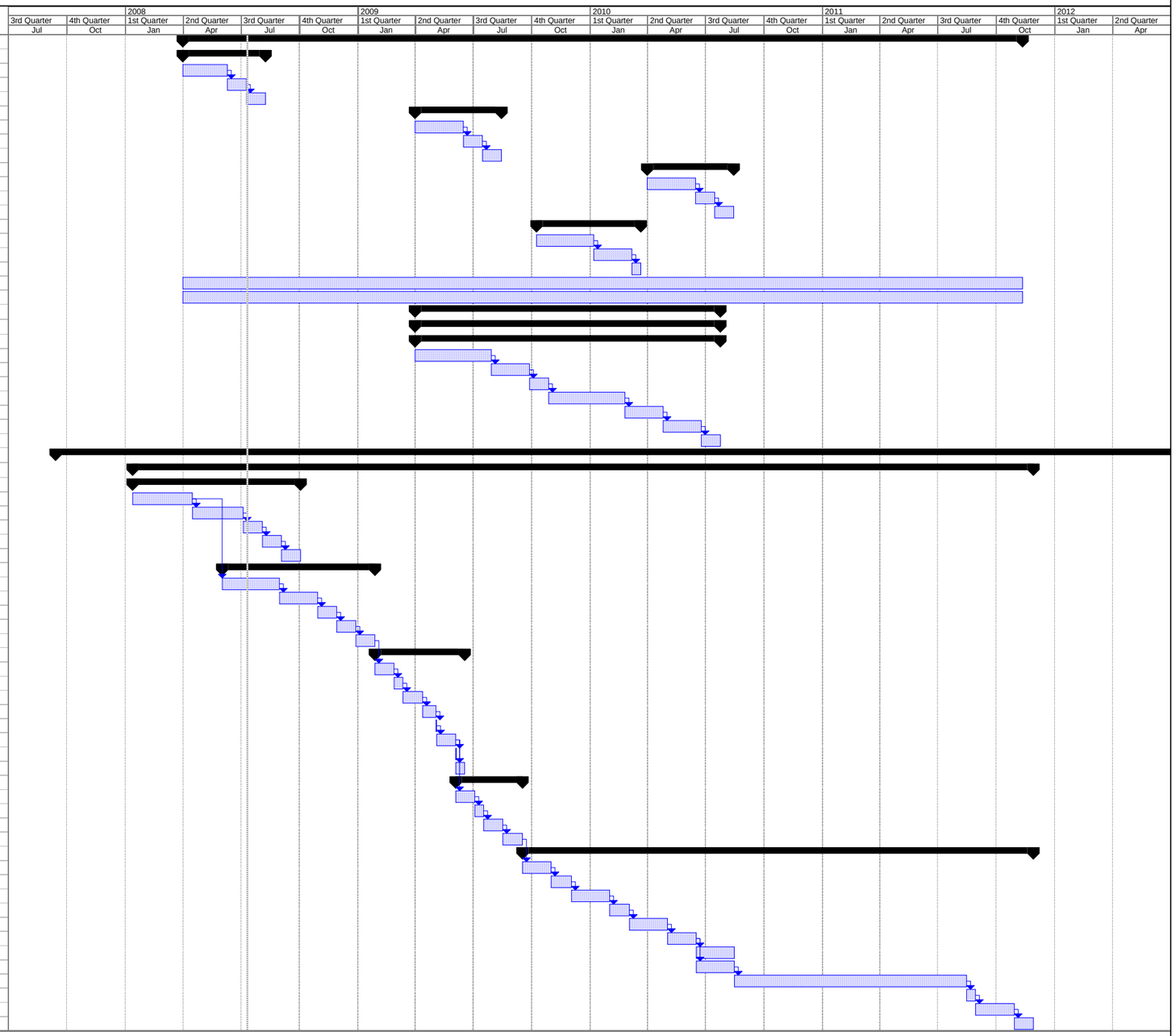
0 500 1000 Feet

Figure 3-3
Location of No Further Action Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

Figure 3-4
Schedule of IR Activities for Fiscal Years 2009 through 2013
Site Management Plan
St. Juliens Creek Annex

ID	Task Name	Duration	Start	Finish	Predecessors
1	**SJCA Facility-Wide**	**1320 days**	**Tue 4/1/08**	**Fri 11/11/11**	
2	**SMP FY 2009 - 2013**	**130 days**	**Tue 4/1/08**	**Fri 8/8/08**	
3	Draft SMP Update	70 days	Tue 4/1/08	Mon 6/9/08	
4	Regulatory/Navy Review of Draft SMP	30 days	Tue 6/10/08	Wed 7/9/08	3
5	RTC and Final SMP	30 days	Thu 7/10/08	Fri 8/8/08	4
6	**SMP FY 2010 - 2014**	**136 days**	**Wed 4/1/09**	**Fri 8/14/09**	
7	Draft SMP Update	76 days	Wed 4/1/09	Mon 6/15/09	
8	Regulatory/Navy Review of Draft SMP	30 days	Tue 6/16/09	Wed 7/15/09	7
9	RTC and Final SMP	30 days	Thu 7/16/09	Fri 8/14/09	8
10	**SMP FY 2011 - 2015**	**136 days**	**Thu 4/1/10**	**Sat 8/14/10**	
11	Draft SMP Update	76 days	Thu 4/1/10	Tue 6/15/10	
12	Regulatory/Navy Review of Draft SMP	30 days	Wed 6/16/10	Thu 7/15/10	11
13	RTC and Final SMP	30 days	Fri 7/16/10	Sat 8/14/10	12
14	**Five-Year Review**	**164 days**	**Fri 10/9/09**	**Sun 3/21/10**	
15	Draft Five-Year Review Report	90 days	Fri 10/9/09	Wed 1/6/10	
16	Regulatory/Navy Review of Five-Year Review Report	60 days	Thu 1/7/10	Sun 3/7/10	15
17	RTC and Final Five-Year Review Report	14 days	Mon 3/8/10	Sun 3/21/10	16
18	**CIP, Administrative Record, and IR Web Sites (Update as needed)**	1320 days	Tue 4/1/08	Fri 11/11/11	
19	**GIS (Update as needed)**	1320 days	Tue 4/1/08	Fri 11/11/11	
20	**PA/SI Sites**	**480 days**	**Wed 4/1/09**	**Sat 7/24/10**	
21	**Site 20 - Wharf Sediments**	**480 days**	**Wed 4/1/09**	**Sat 7/24/10**	
22	**Preliminary Assessment/Site Investigation**	**480 days**	**Wed 4/1/09**	**Sat 7/24/10**	
23	Draft Preliminary Assessment/Site Investigation Work Plan	120 days	Wed 4/1/09	Wed 7/29/09	
24	Regulatory/Navy Review of Draft Preliminary Assessment/Site Investigation Work Plan	60 days	Thu 7/30/09	Sun 9/27/09	23
25	Final Preliminary Assessment/Site Investigation Work Plan	30 days	Mon 9/28/09	Tue 10/27/09	24
26	Preliminary Assessment/Site Investigation Field Activities	120 days	Wed 10/28/09	Wed 2/24/10	25
27	Draft Preliminary Assessment/Site Investigation Report	60 days	Thu 2/25/10	Sun 4/25/10	26
28	Regulatory/Navy Review of Draft Preliminary Assessment/Site Investigation Report	60 days	Mon 4/26/10	Thu 6/24/10	27
29	Final Preliminary Assessment/Site Investigation Report	30 days	Fri 6/25/10	Sat 7/24/10	28
30	**RI/FS Sites**	**2017 days**	**Fri 9/14/07**	**Fri 3/22/13**	
31	**Site 2 - Waste Disposal Area B**	**1416 days**	**Sun 1/13/08**	**Mon 11/28/11**	
32	**Expanded Remedial Investigation Report**	**264 days**	**Sun 1/13/08**	**Thu 10/2/08**	
33	Draft ERI Report	94 days	Sun 1/13/08	Tue 4/15/08	
34	Regulatory/Navy Review of Draft Report	80 days	Wed 4/16/08	Fri 7/4/08	33
35	Draft Final ERI Report	30 days	Sat 7/5/08	Sun 8/3/08	34
36	Regulatory/Navy Review of Draft Final Report	30 days	Mon 8/4/08	Tue 9/2/08	35
37	RTC and Final ERI Report	30 days	Wed 9/3/08	Thu 10/2/08	36
38	**Feasibility Study**	**240 days**	**Mon 6/2/08**	**Tue 1/27/09**	
39	Draft Feasibility Study	90 days	Mon 6/2/08	Sat 8/30/08	33
40	Regulatory/Navy Review of Draft Feasibility Study	60 days	Sun 8/31/08	Wed 10/29/08	39
41	Draft Final Feasibility Study	30 days	Thu 10/30/08	Fri 11/28/08	40
42	Final Feasibility Study	30 days	Sat 11/29/08	Sun 12/28/08	41
43	RTC and Final Feasibility Study	30 days	Mon 12/29/08	Tue 1/27/09	42
44	**Proposed Plan**	**141 days**	**Wed 1/28/09**	**Wed 6/17/09**	
45	Draft Proposed Plan	30 days	Wed 1/28/09	Thu 2/26/09	43
46	Navy Review of Draft Proposed Plan	14 days	Fri 2/27/09	Thu 3/12/09	45
47	Regulatory Review of Draft Proposed Plan	31 days	Fri 3/13/09	Sun 4/12/09	46
48	Draft Final Proposed Plan	21 days	Mon 4/13/09	Sun 5/3/09	47
49	Public Notice (for Draft Final Proposed Plan)	1 day	Mon 5/4/09	Mon 5/4/09	48
50	Public Comment Period (required 30 days)	30 days	Tue 5/5/09	Wed 6/3/09	49
51	Public Meeting	1 day	Thu 6/4/09	Thu 6/4/09	50
52	RTC and Final Proposed Plan	14 days	Thu 6/4/09	Wed 6/17/09	50
53	**Record of Decision**	**105 days**	**Thu 6/4/09**	**Wed 9/16/09**	
54	Draft Record of Decision	30 days	Thu 6/4/09	Fri 7/3/09	50
55	Navy Review of Draft Record of Decision	14 days	Sat 7/4/09	Fri 7/17/09	54
56	Regulatory/Navy Review of Draft Record of Decision	30 days	Sat 7/18/09	Sun 8/16/09	55
57	RTC and Final Record of Decision	31 days	Mon 8/17/09	Wed 9/16/09	56
58	**Remedial Design**	**803 days**	**Thu 9/17/09**	**Mon 11/28/11**	
59	Draft Basis of Design	45 days	Thu 9/17/09	Sat 10/31/09	57
60	Regulatory/Navy Review of Draft Basis of Design	32 days	Sun 11/1/09	Wed 12/2/09	59
61	Preliminary Design (35%)	60 days	Thu 12/3/09	Sun 1/31/10	60
62	Regulatory/Navy Review of Preliminary Design	31 days	Mon 2/1/10	Wed 3/3/10	61
63	Pre-Final Design (90%)	60 days	Thu 3/4/10	Sun 5/2/10	62
64	Regulatory/Navy Review of Pre-final Design	45 days	Mon 5/3/10	Wed 6/16/10	63
65	Final Basis of Design	60 days	Thu 6/17/10	Sun 8/15/10	64
66	Final Design (100%)	60 days	Thu 6/17/10	Sun 8/15/10	64
67	Design Implementation	365 days	Mon 8/16/10	Mon 8/15/11	66
68	Draft Remedial Action Completion Report	14 days	Tue 8/16/11	Mon 8/29/11	67
69	Regulatory/Navy Review of Pre-final Design	61 days	Tue 8/30/11	Sat 10/29/11	68
70	Final Remedial Action Completion Report	30 days	Sun 10/30/11	Mon 11/28/11	69



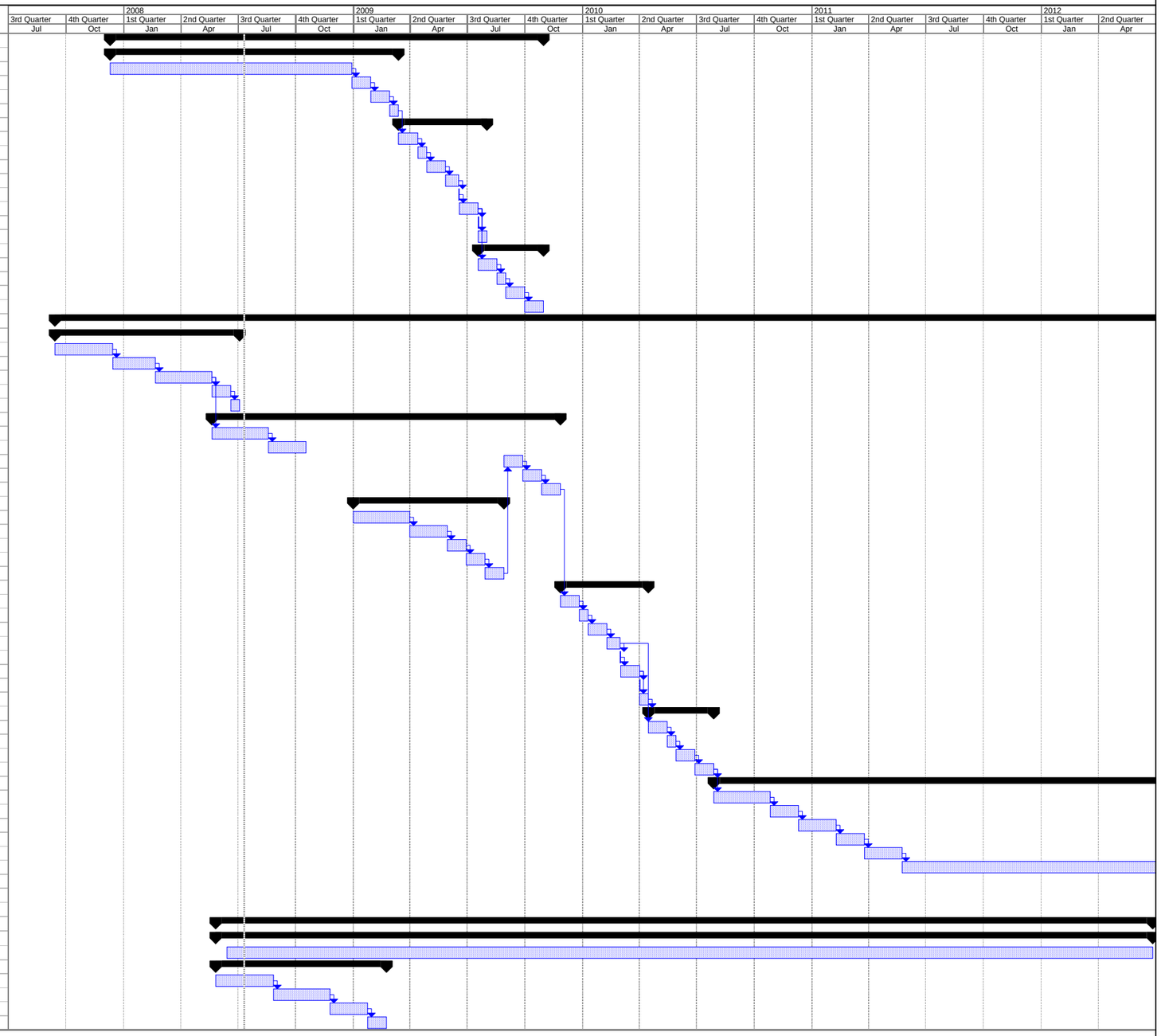
Date: Thu 7/10/08

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | External Milestone | External Milestone | Deadline

Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days.

Figure 3-4
Schedule of IR Activities for Fiscal Years 2009 through 2013
Site Management Plan
St. Juliens Creek Annex

ID	Task Name	Duration	Start	Finish	Predecessors
71	**Site 5 - Burning Grounds**	**690 days**	**Tue 12/11/07**	**Fri 10/30/09**	
72	**EE/CA, Action Memorandum, and Removal Action**	**459 days**	**Tue 12/11/07**	**Fri 3/13/09**	
73	Removal Action Implementation	385 days	Tue 12/11/07	Mon 12/29/08	
74	Draft Construction Closeout Report	30 days	Tue 12/30/08	Wed 1/28/09	73
75	Regulatory/Navy Review of Draft Report	30 days	Thu 1/29/09	Fri 2/27/09	74
76	Final Construction Closeout Report	14 days	Sat 2/28/09	Fri 3/13/09	75
77	**Proposed Plan**	**141 days**	**Sat 3/14/09**	**Sat 8/1/09**	
78	Draft Proposed Plan	31 days	Sat 3/14/09	Mon 4/13/09	76
79	Navy Review of Draft Proposed Plan	14 days	Tue 4/14/09	Mon 4/27/09	78
80	Regulatory Review of Draft Proposed Plan	30 days	Tue 4/28/09	Wed 5/27/09	79
81	Draft Final Proposed Plan	21 days	Thu 5/28/09	Wed 6/17/09	80
82	Public Notice (for Draft Final Proposed Plan)	1 day	Thu 6/18/09	Thu 6/18/09	81
83	Public Comment Period (required 30 days)	30 days	Fri 6/19/09	Sat 7/18/09	82
84	Public Meeting	1 day	Sun 7/19/09	Sun 7/19/09	83
85	RTC and Final Proposed Plan	14 days	Sun 7/19/09	Sat 8/1/09	83
86	**Record of Decision**	**104 days**	**Sun 7/19/09**	**Fri 10/30/09**	
87	Draft Record of Decision	30 days	Sun 7/19/09	Mon 8/17/09	83
88	Navy Review of Draft Record of Decision	14 days	Tue 8/18/09	Mon 8/31/09	87
89	Regulatory/Navy Review of Draft Record of Decision	30 days	Tue 9/1/09	Wed 9/30/09	88
90	RTC and Final Record of Decision	30 days	Thu 10/1/09	Fri 10/30/09	89
91	**Site 21 - Industrial Area**	**2017 days**	**Fri 9/14/07**	**Fri 3/22/13**	
92	**Remedial Investigation**	**294 days**	**Fri 9/14/07**	**Thu 7/3/08**	
93	Draft Remedial Investigation Report	92 days	Fri 9/14/07	Fri 12/14/07	
94	Regulatory/Navy Review of Draft Remedial Investigation Report	68 days	Sat 12/15/07	Wed 2/20/08	93
95	Draft Final Remedial Investigation Report	90 days	Thu 2/21/08	Tue 5/20/08	94
96	Navy/Regulatory Review of Draft Final Remedial Investigation Report	30 days	Wed 5/21/08	Thu 6/19/08	95
97	RTCs and Final Remedial Investigation Report	14 days	Fri 6/20/08	Thu 7/3/08	96
98	**Feasibility Study**	**555 days**	**Wed 5/21/08**	**Thu 11/26/09**	
99	Draft Feasibility Study Report	90 days	Wed 5/21/08	Mon 8/18/08	95
100	Regulatory/Navy Review of Draft Feasibility Study Report	60 days	Tue 8/19/08	Fri 10/17/08	99
101	Draft Final Feasibility Study Report	30 days	Sat 8/29/09	Sun 9/27/09	109
102	Regulatory/Navy Review of Draft Final Feasibility Study Report	30 days	Mon 9/28/09	Tue 10/27/09	101
103	RTC and Final Feasibility Study Report	30 days	Wed 10/28/09	Thu 11/26/09	102
104	**Remedial Investigation Addendum**	**240 days**	**Thu 1/1/09**	**Fri 8/28/09**	
105	Draft Remedial Investigation Report Addendum	90 days	Thu 1/1/09	Tue 3/31/09	
106	Regulatory/Navy Review of Draft Remedial Investigation Report Addendum	60 days	Wed 4/1/09	Sat 5/30/09	105
107	Draft Final Remedial Investigation Report Addendum	30 days	Sun 5/31/09	Mon 6/29/09	106
108	Regulatory/Navy Review of Draft Final Remedial Investigation Report Addendum	30 days	Tue 6/30/09	Wed 7/29/09	107
109	Final Remedial Investigation Report Addendum	30 days	Thu 7/30/09	Fri 8/28/09	108
110	**Proposed Plan**	**140 days**	**Fri 11/27/09**	**Thu 4/15/10**	
111	Draft Proposed Plan	30 days	Fri 11/27/09	Sat 12/26/09	103
112	Navy Review of Draft Proposed Plan	14 days	Sun 12/27/09	Sat 1/9/10	111
113	Regulatory Review of Draft Proposed Plan	30 days	Sun 1/10/10	Mon 2/8/10	112
114	Draft Final Proposed Plan	21 days	Tue 2/9/10	Mon 3/1/10	113
115	Public Notice (for Draft Final Proposed Plan)	1 day	Tue 3/2/10	Tue 3/2/10	114
116	Public Comment Period (required 30 days)	30 days	Wed 3/3/10	Thu 4/1/10	115
117	Public Meeting	1 day	Fri 4/2/10	Fri 4/2/10	116
118	RTC and Final Proposed Plan	14 days	Fri 4/2/10	Thu 4/15/10	116
119	**Record of Decision**	**104 days**	**Fri 4/16/10**	**Wed 7/28/10**	**118**
120	Draft Record of Decision	30 days	Fri 4/16/10	Sat 5/15/10	114
121	Navy Review of Draft Record of Decision	14 days	Sun 5/16/10	Sat 5/29/10	120
122	Regulatory/Navy Review of Draft Record of Decision	30 days	Sun 5/30/10	Mon 6/28/10	121
123	RTC and Final Record of Decision	30 days	Tue 6/29/10	Wed 7/28/10	122
124	**Remedial Design**	**968 days**	**Thu 7/29/10**	**Fri 3/22/13**	**123**
125	Preliminary Design (35%)	90 days	Thu 7/29/10	Tue 10/26/10	123
126	Regulatory/Navy Review of Preliminary Design	45 days	Wed 10/27/10	Fri 12/10/10	125
127	Pre-Final Design (90%)	60 days	Sat 12/11/10	Tue 2/8/11	126
128	Regulatory/Navy Review of Pre-final Design	45 days	Wed 2/9/11	Fri 3/25/11	127
129	Final Design (100%)	60 days	Sat 3/26/11	Tue 5/24/11	128
130	Design Implementation	548 days	Wed 5/25/11	Thu 11/22/12	129
131	Draft Remedial Action Completion Report	30 days	Fri 11/23/12	Sat 12/22/12	130
132	Regulatory/Navy Review of Pre-final Design	60 days	Sun 12/23/12	Wed 2/20/13	131
133	Final Remedial Action Completion Report	30 days	Thu 2/21/13	Fri 3/22/13	132
134	**Response Complete Sites**	**1492 days**	**Tue 5/27/08**	**Tue 6/26/12**	
135	**Site 4 - Landfill D**	**1492 days**	**Tue 5/27/08**	**Tue 6/26/12**	
136	**Annual Inspections and Reporting**	1474 days	Sat 6/14/08	Tue 6/26/12	
137	**Voluntary Groundwater Monitoring**	**272 days**	**Tue 5/27/08**	**Sun 2/22/09**	
138	Voluntary Groundwater Monitoring	92 days	Tue 5/27/08	Tue 8/26/08	
139	Draft Voluntary Groundwater Monitoring Report	90 days	Wed 8/27/08	Mon 11/24/08	138
140	Regulatory/Navy Review of Draft Voluntary Groundwater Monitoring Report	60 days	Tue 11/25/08	Fri 1/23/09	139
141	Final Voluntary Groundwater Monitoring Report	30 days	Sat 1/24/09	Sun 2/22/09	140

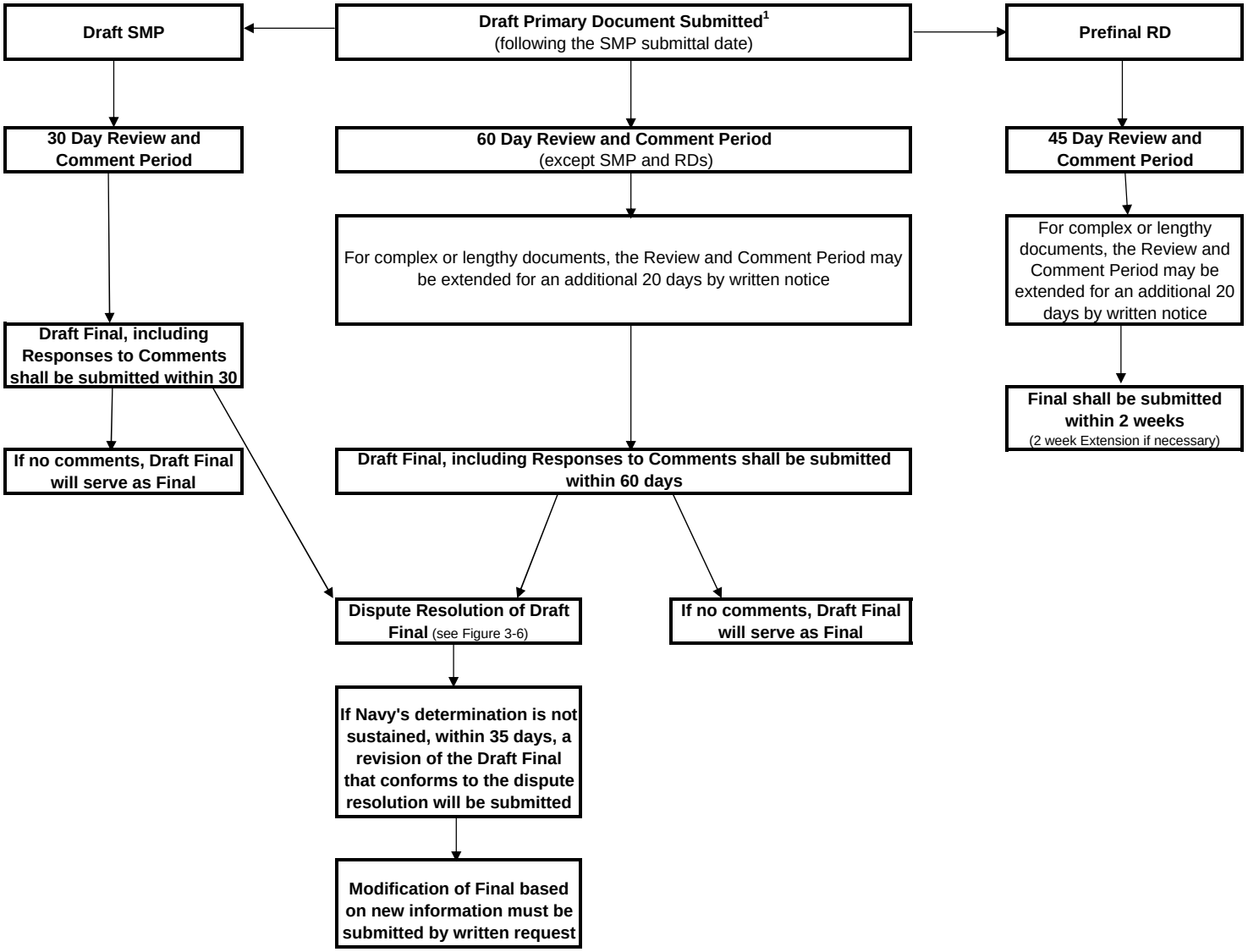


Date: Thu 7/10/08

Task | Progress | Summary | External Tasks | External Milestone | Deadline
Split | Milestone | Project Summary | External Milestone | External Milestone

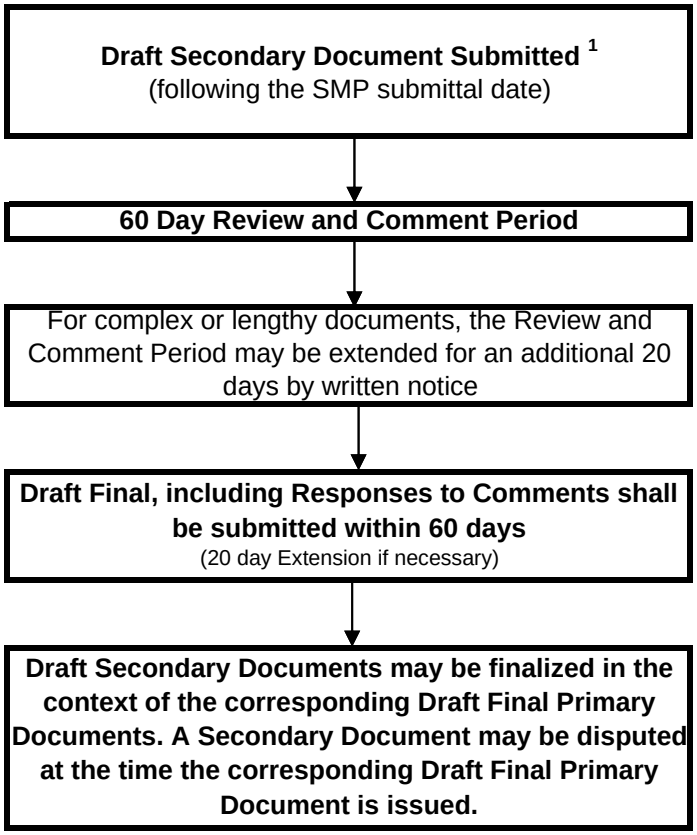
Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days.

Figure 3-5
Primary Document Submittal Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia



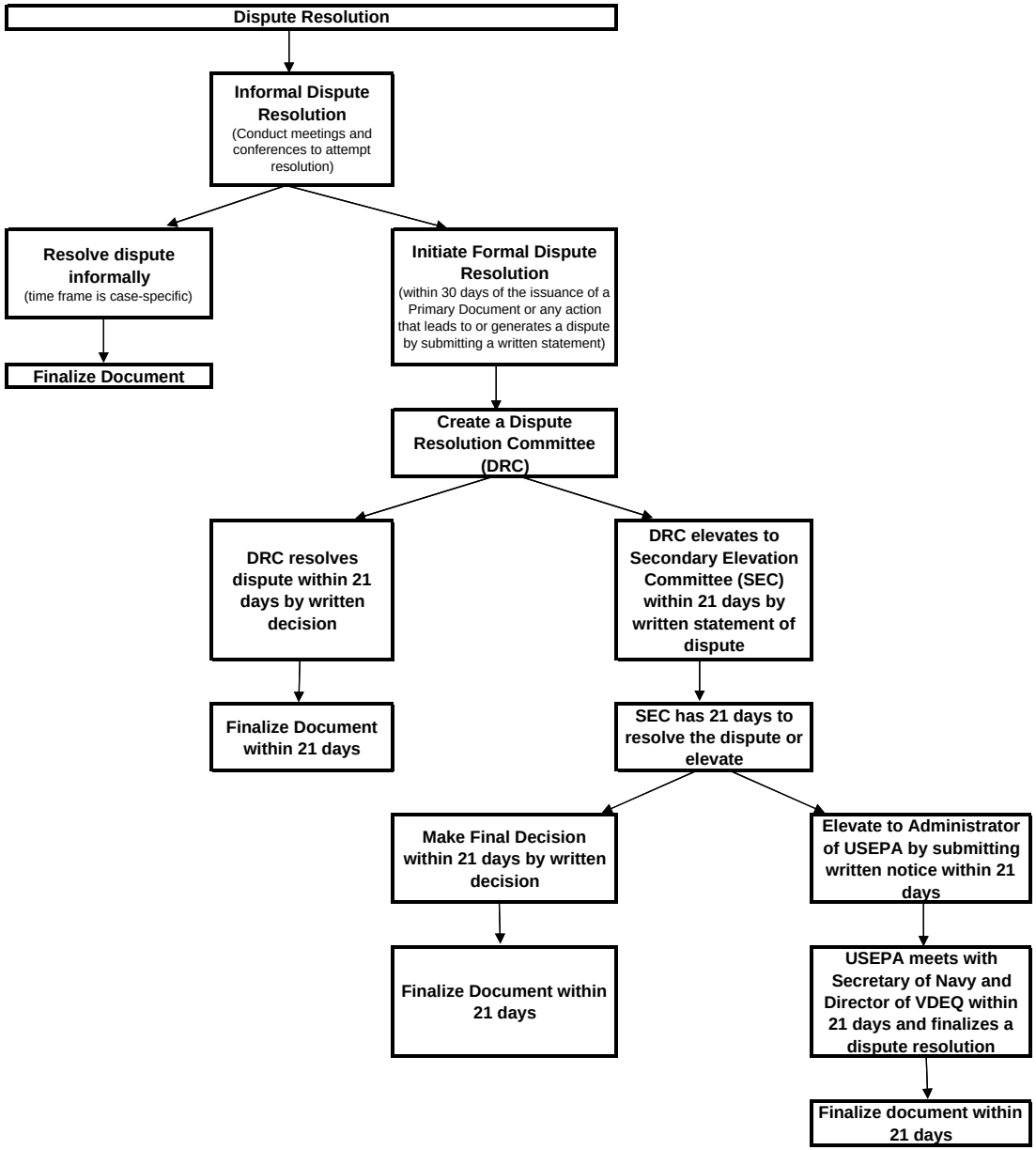
[1]SJCA Primary Documents Include: Remedial Investigation (RI)/Feasibility Study (FS)/Focused Feasibility Study (FFS) Work Plans, RI Reports, FS and FFS Reports, Proposed Plans (PPs), Records of Decision (RODs), Final Remedial Designs (RDs), Remedial Action Work Plans, Remedial Action Completion Reports (RACRs), and Site Management Plans (SMPs)

Figure 3-6
Secondary Document Submittal Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia



[1]SJCA Secondary Documents Include: Health and Safety Plans (HSPs), Non-Time-Critical Removal Action (NTCRA) Plans, Pilot/Treatability Study Work Plans and Reports, Engineering Evaluation/Cost Analysis (EE/CA) Reports, Well Closure Methods and Procedures, Preliminary/Conceptual Designs or equivalents, Prefinal Remedial Designs (RDs), Periodic Reviews/5-Year Review Assessment Reports, Removal Action Memorandums, Preliminary Closeout Reports (PCORs)/Final Closeout Reports (FCORs)

Figure 3-7
Dispute Resolution Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia



SECTION 4

Navy Land Use Planning

The SJCA IRP has developed a Geographical Information System (GIS) that identifies areas of past or present environmental concern. The attached compact disc (CD) provides maps and GIS layers in Arcview® for the active IRP and MRP sites; NFA IRP sites; IRP sites with LUCs; petroleum, oil, and lubricant (POL) sites; active or NFA IRP and MRP sites where MEC, material potentially presenting an explosive hazard (MPPEH), or munitions debris (MD) have been identified during previous intrusive activities or the potential exists to encounter those items; and IRP and MRP sites with an ESS or ESS Waiver for intrusive activities. As information changes based on ongoing site investigations, desktop GIS updates are provided. This information is available to facility personnel for environmental considerations during operational planning and decision-making, and to ensure that LUCs are maintained at sites where they are identified in the ROD as part of the remedy.

In the event DoD activities will influence the areas outlined or highlighted on the CD, the NAVFAC Regional Project Manager should be consulted:

Mr. Walt Bell
Naval Facilities Engineering Command, Mid Atlantic
Environmental Code EV3, Bldg N-26, Rm 3208
9742 Maryland Avenue
Norfolk, Virginia 23511-3095
(757) 444-4114

SECTION 5

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